University of Washington

ARBORETUM BULLETIN

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Concerning this issue. . .

During this summer that seems more like spring, our *Bulletin* is concerned with various aspects of gardening.

We have two articles whose focus is farming-gardening. Brad Wetmore documents the methods and describes the philosophy of the fast-disappearing Greek hillfarming—a traditional style of farming that provides long-term sustainable yields on marginal lands. Mary Palmer, former Seattlite, leads a tour of her self-contained Jedidiah Island paradise, specifying plants for the vegetable garden and orchard that are suited to our climate.

Ornamentally speaking, Jerri Spalding Fredin tells the tale of her long and continuing involvement with the beautiful vine *Akebia.*

Afield in search of faraway gardens—this is the first installment of Joseph Witt's account of the Arboretum Horticultural Tour to Korea last autumn. He treats us to a plantsperson's view of Seoul and the island of Cheju.

And in nature's garden—take a summer venture into our old growth Washington forests, keeping an eye out for the strange and beautiful parasitic members of the heather family, described by Mary Alice Sanguinetti.

And don't miss the Summer Stroll of the Arboretum in August—see the back cover for details.

SUSAN LIBONATI-BARNES

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ARBORETUM BULLETIN

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COVER

Handmade winnowing tools and a watering jar, typical of the beauty of implements used in the traditional Greek hillfarming community (see page 11).

Photo: Brad Wetmore

In Memory of Dr. Daniel Elliot Stuntz
1909—1983

I would like to commemorate the passing of Dr. D.E. Stuntz with an appreciation of his contribution to all of us. Not only was he known to many members of the Arboretum Foundation and the University of Washington, but he was the advisor for my own work in mycology, and was my friend.

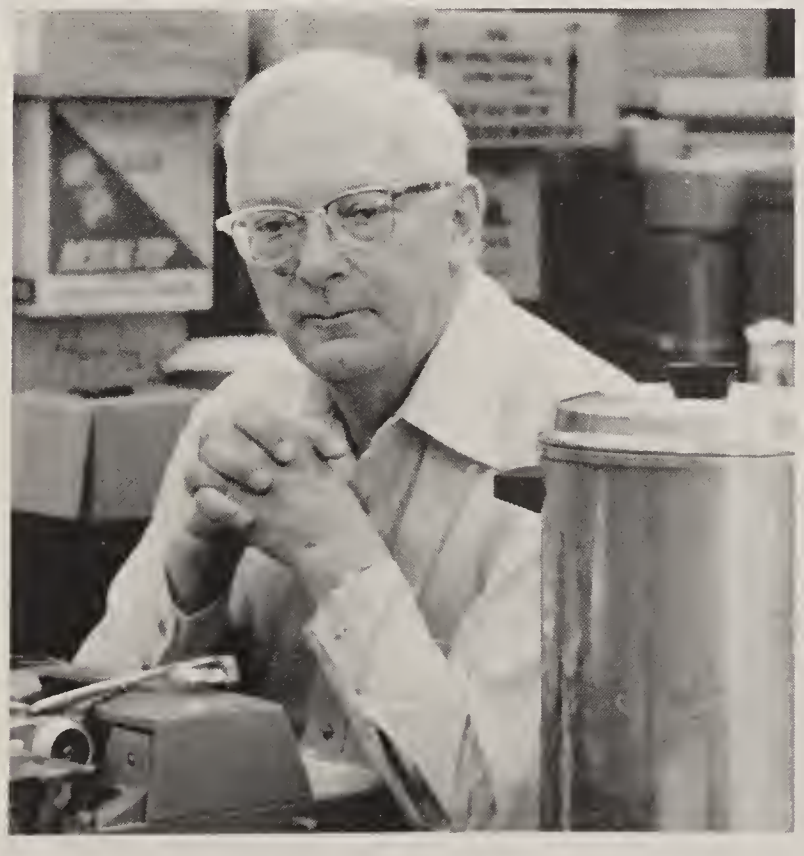
Readers of the Arboretum Bulletin include many types of plantspeople who interacted with Dr. Stuntz in different capacities: his colleagues and friends in the departments of Botany and Zoology at the University of Washington, former and present students at the University, the dedicated amateur mycologists of the Puget Sound Mycological Society, and the many people who sought his fungal expertise. But among the membership of the Arboretum Foundation, Dr. Stuntz perhaps is best known as the patient, knowledgable and creative teacher of amateur mycology through Continuing Education at the University of Washington.

We will remember his intellectual gifts—a broad and thorough knowledge of mycology and biology in general, a facility with languages, a love of literature, music and the arts, and a continuing interest in further learning. His students will remember his teaching—the clarity, the tempo, the beautiful drawings created just for the moment, the wit—attentions to the minds of the students, and foods and wine for their cultural enhancement. All these deft touches springing from a sense of style characterized by generosity—generosity of materials, of expertise, and most notably of time.

Daniel Stuntz was born in Milford, Ohio on March 15, 1909; his family soon moved to Seattle where he later graduated from Queen Anne High School and then from the University of Washington. He obtained his Ph.D. from Yale University and returned in 1940 to teach at the University of Washington. Official honors have included a full professorship in 1959, distinguished professorship (and the Alumni Distinguished Teaching Award) in 1974, and the Award for Contribution to Amateur Mycology from the North American Mycological Association in 1977.

I would like to thank Dr. Daniel Stuntz for sharing his unique view of the esthetics of science, and for making it accessible to all who wished to learn. Though we have lost a knowledgable scientist, a gifted teacher and an exceptional friend and colleague, let us all be glad of the opportunity to know him.

SUSAN LIBONATI-BARNES



Where space is limited but emotion is not, one is forced to speak mostly in the abstract, but it is the specific event that leaves the vivid memory. Dr. Stuntz taught me to express exasperation creatively, to savor what I eat, to make a mural of a blackboard, to ferret out the unusual, to snorkel in the tidepools of the microscope, and to bring science to people a little afraid to try it.

Photo: Dr. Fred Van De Bogart

Rock formations of Halle san, on the volcanic island of Cheju (page 7). Photo:J.A. Witt

A Horticultural Tour of Korea
or Life After M*A*S*H*

Part I—Seoul and Cheju-do

JOSEPH A. WITT

"When China is now open to foreign visitors, why do you want to take a group to Korea?" This was the question that I had to answer again and again when I began to consider a horticultural tour of Korea in 1981. Actually, it wasn't hard to find a number of excellent reasons for choosing Korea.

Korea Because. . .

The Arboretum had an excellent contact in Mr. Carl Ferris Miller, a Korean citizen, who knows the country and its flora in a way few westerners do and who owns an extensive Arboretum on its west coast. Mr. Miller had visited us in Seattle a number of times and always remarked how similar the climate and plant collections in the Washington Park Arboretum were to his Chollipo Arboretum. When I made some comment that it might be possible to put a tour group together for a visit, he was enthusiastic and volunteered his assistance.

The vegetation of Korea represents an interesting blending of a warm temperate flora from southern Japan and a cold temperate

Gardeners shearing shrubbery on the grounds of the Shilla Hotel in Seoul. Photo: J.A. Witt

flora from Manchuria. Within an area about the size of the state of Indiana, one can find an array of plants ranging from broad-leaved evergreens such as *Cinnamomum* and *Piper* which are not hardy in Seattle to spruces and birches which grow well in the coldest areas of the state of Washington. Korea's native flora covers a range similar to the United States Department of Agriculture Plant Hardiness Zones 2 through 10.

The Korean flora has not been collected as intensively as has Japan's and, while there has been increased interest in it in recent years, there would appear to be many fine ornamentals that are still relatively unknown in western gardens. It was not our intention to be primarily a collecting group, rather we hoped to gain some appreciation of what plants might be available and to make the necessary personal contacts to expedite future introductions. Actually, we did collect seeds and, in some instances, plants or cuttings since the best time for collecting is when you are there. . .

We were interested in seeing what the Korean people were doing in the field of ornamental horticulture. While much has been written about gardens in Japan and recently in China, little has been said about Korea. The Koreans have influenced and been influenced by their neighbors, yet remain culturally distinct in many ways. We felt there might be something to learn from them in gardening techniques. It also must be admitted that most of our group were curious about the country, its people and their customs. In this respect, we were typical tourists.

Off to Korea

On September 18, 1982, our group of seven Americans and six Canadians boarded Northwest Orient's flight 19 for a non-stop trip to Seoul. We arrived over Korea just at sundown and were treated to a scene we would see repeated again and again. Brown or yellow-green rice fields carpeted valley floors while sharp ridges clothed in large part with conifers rose on each side. This was our first introduction to the nexus of cultivated valleys and numerous low to tall mountain ranges which make up much of South Korea. Mr. Miller and Mr. "Jay" Kang, our representative from the Korean Tourist Bureau (the K.T.B.), met us at the airport and arranged our transfer to the Shilla Hotel. This was a modern and comfortable hotel where we joined the last member of our group who had flown in earlier from England.

Seoul

The grounds of the Shilla were extensive and gave us our first exposure to Korean ornamental horticulture. What we saw there we saw again and throughout our tour, although with variations on the theme. Most

chores were done by hand with the simplest of tools: shears, sickles, rakes, shovels and hoes. There seemed to be no shortage of labor, and the gardeners, about equal numbers of men and women, appeared hard-working and diligent. One tableau I shall always remember was of some ten people shearing some evergreen shrubs at the base of a fountain. There were more gardeners in a hundred square feet than we have for the two hundred acres of the Arboretum! Certain impressions stand out: the turf was dry and coarse, mowed by sickles; the shrubs were largely evergreens, either needle- or broad-leaved, and were usually sheared low into rounded outlines; in September the most common flowering material was a yellow chrysanthemum; weeds were not allowed and trees were treasured. Several large ginkgos had recently been moved into the grounds and the trunks were wrapped from root to crown with straw matting, I suspect to protect from sun-scald. The moving seemed to have been done as well or better than we could do even though these were very large specimens.

We spent several days in Seoul recovering from jet lag and visiting points of horticultural interest in the vicinity. Seoul is a city of 9 million, situated in a basin surrounded by many bare rocky ridges. Its location and size practically guarantee that it will have a severe case of smog—which it does—manifested by a gray haze which at times reduced our viewing to nearby vistas.

Our first afternoon was spent visiting a wholesale flower market located near South Gate where several floors of a large building were divided into small booths or shops each crammed with potted plants, cut flowers and branches for sale. Chrysanthemums and roses were the most common, but huge branches laden with orange persimmons or the red fruits of mountain ash were also available. The flat roof was covered with pots of yellow or white "mums," many being trained in cascade style. A quick walk through the South Gate Open Market introduced us to tiny shops and stalls of a typical oriental market. Full of color, noise, throngs of people, strange odors, it was fascinating and confusing, an assault on the senses. Perhaps to the western eye, the strangest feature was the juxtaposition of diverse shops. One selling beautiful vegetables could have a shoe stall on one side and a fish market on the other with a handcart of bright fabrics in front.

On a somewhat more restrained level was the Seocho-dong tree market, a street with nurseries on both sides, extending for a mile or more. The shops here tended to be wooden frames covered with plastic and opening at the rear onto long narrow plots of ground where

The ever-popular chrysanthemum for sale in the wholesale flower market near South Gate, Seoul. **Photo: J.A. Witt**

ornamentals were grown. Aside from thousands upon thousands of sapling trees for sale (Seoul is rapidly becoming reforested along its streets), there were house plants of many types and the ubiquitous chrysanthemum. It surely takes many plants to satisfy the green hunger of the citizens of this city of 9 million.

That evening, we were the guests of Mr. Miller at a reception in the Seoul Club where we met a number of Koreans interested in botany, horticulture and forestry. Among the guests were Dr. T.B. Lee who had just written a definitive flora of Korea, Dr. Y-N Lee, author of a new work on endangered plants and animals of the country, and Dr. Cho, Curator of the Hong-nung Arboretum which we were to visit the next day.

Arboreta Near Seoul

The Hong-nung Arboretum is on the grounds of the headquarters of the governmental Forest Research Institute. We were greeted by Dr. Kim, Kap Sung, its director, and spent two or more hours touring their extensive collections. First established in the 1920s, it was revitalized at the end of the Korean conflict. Laid out on a rather steep hillside, it boasted of a wide selection of native plants with collections of those used for culinary and medicinal purposes. It even contained a small zoo. I could not find out if the Forest Research Institute is open to the public, but there seemed to be considerable activity which may have been connected with its research function. Fortunately, the labeling was good, since I found I was encountering many unfamiliar plants. One that especially stood out was a lovely amethyst-fruited *Callicarpa* looking like a column of purple mist.

Japanese red pine, *Pinus densiflora*, graces the slopes of Mt. Halle on the island of Cheju (page 8). Photo: J.A. Witt

The afternoon was spent at the Kwang-nung Research Station. The drive, some two hours from Seoul, took us through the densely populated suburbs on narrow roads teeming with buses, children and bicycles, and past tiny open-fronted shops by the tens of thousands. Once in the country, there were the golden-brown rice fields being harvested by hand: papa, momma, grandfather and grandmother, and after school, the kids, all bent over the ripe grain with sickle in hand. It looked like hard work, but the results—closely mown fields and neatly arranged sheaves of grain—must have been rewarding. Apple and pear orchards also lined the road in places; the pears were the large green-brown round oriental varieties and were wrapped individually while still hanging on the tree.

At the research station we were treated to a jeep ride that took us through plantations of young trees to a hilltop of native woodland. There, trees were largely deciduous broad-leaved species which included several hornbeams *(Carpinus), Styrax japonica* and *S. obassia,* and at least three maples including the uncommon *Acer triflorum. Lindera obtusiloba,* a spice bush which has been highly successful in the Arboretum, was most common as was, unfortunately for me, *Rhus verniciflua,* a poison sumac. I reached for a striking cluster of its seeds and suffered a rather nasty rash for my indiscretion.

The forest plantations were of considerable interest since they were blocks of many, many species, exotic and native. We saw katsura tree *(Cercidiphyllum),* several firs, black locust *(Robinia pseudoacacia)* and even blocks of Empress tree *(Paulownia).*

The Island of Cheju

Our next expedition was to the island of Cheju off the southern tip of Korea. We flew there on a Korean Airline jet, a smooth and comfortable flight which we appreciated after facing mobs of fellow travelers at the airport. Here we were reminded that South Korea was still at war, as the safety precautions were strict and even included a body search. Mr. Kang, our courier, "Jay" to us by now, earned an award of merit by shepherding us through this ordeal.

Cheju-do is a mass of volcanic rock rising from the sea with Mt. Halle, Halle san, reaching an elevation of about 1950 m. (6400 ft.) in the center. Its climate is warm maritime in the lowland areas along the coast, and oranges, grapefruit and pineapple grow there. Much of our time was spent touring around the island, visiting various villages and towns and stopping to see both native and introduced plants along the way. Cheju-do has a strikingly beautiful coast—craggy off-shore islands, sandy to rocky beaches, high cliffs with cascades. In some areas, the shoreline is carpeted with broad-leaved evergreens and conifers. Where protected from storms as in inlets or narrow bays, there is often a rich semi-tropical flora. At one site, we found *Neolitsea sericea* (a cinnamon relative), a species of *Elaeocarpus, Piper kadzura* (a vine which produces the spice pepper), *Camellia japonica, Ternstroemia japonica,* and on the very edge of the cliffs, Japanese black pine, *Pinus thunbergii,* often stunted and wind-contorted.

Camellia japonica obviously loves this climate. In one small village camellias are used as street trees and have trunks 12 to 16 inches in diameter and over thirty feet high. Sadly, however, these giants are dying, in part because of lack of care and perhaps in part because of old age.

Special Plants

Our guides, Mr. Lee from the Cheju branch of the Korean Science and Agriculture Research Station, and Mr. Miller, were so familiar with the plants of the island that we were shown many unusual specimens that might easily have been overlooked. One stop was Cholbuam (Chaste Wife Village), to see a large

An ancient holly, *Ilex rotunda,* perhaps 450 years old, in Sokwipo (page 8). Photo: J.A. Witt

evergreen tree which had never been properly identified. It is an *Osmanthus,* probably, but its species is unknown. The village was typical of the dozens we saw, houses built often of basalt rock sometimes with thatched, sometimes with brightly colored sheet metal roofs. They were not large; however, nearly all sported TV aerials. The local people were usually surprised at an invasion of a bus full of caucasians, but were invariably friendly and helpful. At Hallim, when we stopped to visit a training school where nuns were teaching the manufacture of Irish-style woolen fabrics, our two guides insisted we also visit a school yard where there was an unusually large *Pittosporum tobira* and another member of the laurel family, *Litsea japonica,* with lovely pale green leaves nearly white on the underside. Perhaps our most exciting coastal trip was to Sokwipo, a moderate-sized community on the south coast. It sits on high cliffs above the ocean with a handsome view of a group of off-shore islands. There had been some threat of a storm and the waves and winds were wild. By dint of masterful driving, we threaded our

Street market on Cheju. Photo: J.A. Witt

way through a labyrinth of narrow, wall-lined streets (much to the amusement of the local children) to find a truly giant holly. This specimen of *Ilex rotunda,* reputed to be 450 years old, has a trunk perhaps 15 inches in diameter and 40 feet tall. Standing nearly in the middle of the street, it has been preserved in an island in the asphalt paving.

Mountain Flora

The volcanic mountain Halle san rises above timberline and is snow-capped during the winter. It has been set aside as a National Park. Our winding road took us through the cultivated lowlands, then into mixed broad-leaved evergreen and deciduous woodland. Here a few botanizing and seed collection stops gave us *Malus micromalus,* a smallish crabapple with orange-red fruit, *Sorbus commixta,* and a confusing mixture of oaks, hornbeams *(Carpinus)* and maples. A ground cover of dwarf bamboo, *(Sasa quelpaertensis)* made a dense stand in the deep shade. Our lunch stop was at a meadow with an elevation of 1100 m., said to be the highest point any regular road reaches in Korea. This camp meadow delighted those of our group whose interest is in perennials. Filled with asters, gentians, and iris, it reminded one of the moist meadows seen on the eastern slopes of the Cascade Mountains. Shrubs were there as well: *Rhododendron mucronulatum* in seed, winged euonymus with its tiny leaves just turning red *(Euonymus sieboldianus),* and a groundcover of several roses. Another stop saw us scrambling through a forest laced together with vines. *Akebia quinata, Smilax china,* a species of *Ampelopsis, Stauntonia hexaphylla* and others made walking difficult, but we did penetrate deeply enough to find 30-foot trees of *Daphniphyllum macropodum,* a handsome evergreen with leaves mimicking those of a rhododendron. True rhododendrons were there as well: *R. mucronulatum* was very common; less so were two azaleas, *Rhododendron weyrichii* and *R. yedoense* var. *poukhanense.* The road finally led us to a trailhead where we started an exhausting climb toward the subalpine meadows above. The trail literally went up as steps in many places. Obviously, to the hardy Koreans, the shortest way between two points is a straight line, even if up a cliff side! Their trail-builders never once thought of switchbacks or contouring. The climb was worth the struggle, though, since it took us through deciduous forests of oak, maple and hornbeam, and past pines and rare trees of *Abies koreana,* a truly lovely fir with bright green foliage and purple-brown cones. We broke into the open on a windswept ridge with flora similar to that seen in our own high meadows. Crowberry *(Empetrum nigrum)* was common; purple asters everywhere, knotweeds, violas, gentians and onions *(Allium)* were seen in the short turf. In

slightly more protected sites, a *Symplocos* was covered with bright blue fruits and that relative of our vine maple, *Acer pseudosieboldianum,* was beginning to develop its brilliant fall color.

We were not alone. There was a constant stream of young people climbing and descending. They obviously belonged to classes on field trips and were friendly, but appeared surprised to see us on the trail. One group even "adopted" one of our members and to her amusement carefully escorted her back to the parking areas upon inquiring her age and learning she was over 65.

Farewell to Cheju-do

Cheju-do is worthy of more study since one can see subtropical to alpine flora within a matter of a few miles. It also is a beautiful island with warm and friendly people. Accommodations are excellent and a very adequate highway system allowed us to visit nearly everywhere we wished to go. We were all sorry to leave as we boarded the plane to fly to Kwang-ju.

(to be continued)

In Praise of Yards

GEORGE SCHENK

Some homeowners choose to live lives on treeless properties for reasons no doubt various, chief among them (I've always thought) being that they simply cannot abide leaves: leaves that grow and increase, leaves that call it a day and fall on the lawn, the sidewalk, the terrace table, perhaps. With these folks, leafage is usually confined to a spare number of shrubs, several perennial plants, and a grass lawn. Altogether this vegetation makes up a yard, not a garden. Not yet. The planting of trees or even of a tree singular usually makes all the difference.

But let me give the good old yard its due, plain and honest place that it is, the domain of so much of the good life. Who does not have a treasury of memories garnered in backyards? With a loaf of bread, a jug of wine, and the right company, the grass carpet out in back can be paradise enow.

Certain examples of yards (probably not the choicest for picnicking) comprise for me a kind of folk art. My favorite of the genre is the barest yard I've ever seen, clean as a hound's tooth, nothing but open lawn all around the house. The effect is shockingly beautiful: house and lawn, a ship serenely moored. The house so starkly placed in view is fortunately well worth viewing.

The house is old (circa 1900), freshly painted white, a plain clapboard structure lacking the gingerbread of the time. Touches of Edwardian larding exist in the lumbersome framing of the windows—all jutting brows and sills, giving the house an inward look, a self-assurance of the rightful separation of indoors and outdoors—and in two red brick chimneys that rise from the roof five feet tall, and are then cantilevered at top into a capitulum of sheer, daring brickwork, a triumph of craftsmanship over several damaging earthquakes hereabout in the lifetime of the chimneys.

Aside from the house the lot contains a concrete walk and a flat expanse of lawn, lawn up to the clapboard walls and outward to a picket fence, lawn kept short and edged to a waver-tolerance of half an inch or less. That is all. There is no driveway, hence no car to clutter the yard, no garage or other ancillary structure, no clothes-line, no tree, no shrub, no little plant anywhere, not even a hawkweed hanging out in a corner, no garbage can, no dog woofing and glaring through a fence in front—no fence in front (at the sides and back,

yes), no bird bath, no cement flamingo, no snake of a garden hose, nor any of the other holies of yards except a grass lawn; of that there is about a third of an acre.

I drive by alone or I bring friends interested in landscaping. In half a dozen pilgrimages I've never seen anybody in the yard, and I'm not really surprised. It is most unpicnicky-looking. Except for lawn care the yard would seem to me to offer nothing to do but walk briskly to the door of the house from the T-crossing of the public sidewalk in front, or briskly out and away.

I drive by slowly, totting up all the absent jumbos and missing bits of the yards I have known into a negative whole and I feel peculiarly refreshed. This is not the usual. Not the usual yard, nor any known species of home landscaping. I can't call it the typically lonely yard of plants standing here and there, isolated beyond communication. To give off loneliness a yard has to have lone things in it (here the house is too self-contained for loneliness). Neither is this the spare sensible garden of edibles and cuttable flowers, with an heirloom clump of rhubarb feasting on compost behind the shed (where there is no shed). Certainly this is not the naturalistic garden of bosky islands and narrow channels, the house back there somewhere foundering in branches. Neither is this the costume garden wearing Japanese or Spanish or Italian trappings with a rented aspect. Nor is it even the gardeny garden of sunny annuals and easy chairs soliciting in the shade. Nothing so handily loveable and deplorable as any of these. Simply not a garden at all: the materialization, I think, of every gardener's dream when achy with weeding.

This stunningly bare yard is the work of a mind made up about home gardening better than any other I've encountered, and is just about the strongest statement a homeowner can make against leaves that grow and fall. The only more emphatic manifesto would be to pave the whole darn place, or spread crankcase oil, or say it with plastics (flowers, lawn, shrubs, trees, all acrylic: it's been done).

What could I, one of the more arboreous gardeners, at home in boscage, shady allees, chambers framed in boughs and tapestried with foliage, possibly impart to the distinguished yardner in residence here?

Maybe I will knock on the door sometime, at that, a tree cultist seeking converts. I'll say, "Hello, there. It's Johnny Appleseed Day, today, I have a little 'Gravenstein' tree for you. It is a gift with a future, a promise of flowers, shade, fruit and companionship. I will plant it here in the front yard if you like. No charge at all."

But the great yardner will not listen, having ever resisted all plantly scraps, seedlings, cuttings, and thinnings, well-meaning nuisances such as I enjoy handing out, or else has accepted these tender gifts malignly, propping them somewhere unplanted until they become crisp. I see the door closing, the yardner's gimlet eye upon me narrowed to nothingness as the closing door scissors the space between us. No leaves for this chum, a foliarphobe if ever there was one.

Hort AF-Fair 1983

Over two hundred Puget Sound area vocational horticulture students and their teachers attended the 1983 Hort AF-Fair. One-half day was spent attending three 35-minute lectures exploring careers in horticulture. Speakers included John A. Wott, "Urban Horticulture," Becka Hanson, "Landscape Architecture," and Pat Campbell Brain, "Landscape Maintenance." The second part of the day included tours of the Washington Park Arboretum led by our dedicated guides under the coordination of Jan Pirzio-Biroli. The Unit Council provided refreshments at the conclusion of the tours. The "fruits" of such a program will mature in several years as these students make educational and vocational decisions.

A scene reminiscent of ancient Chinese landscape paintings—the landscape composed of people and plantings in a natural balance (page 13). This coastal hillfarm is on the island of Corfu, on a bluff above the beach. Photo: B. Wetmore

Greek Hill Farming: The Edible Landscape

*BRAD WETMORE**

Travelers in foreign lands are continually questioned about their reasons for traveling. I journeyed in Greece for nearly a year and time after time people asked me what I was really doing there. I searched about for a reasonable response. Of course those doing the asking were rarely ready for the answer. After all they were just making conversation and usually lost interest long before the end of my explanation. So, in case I was talking to someone who really couldn't care less, I generally limited my first response to two words: traditional hill farming. After that, if they asked me to elaborate, I considered them fair game.

*Brad Wetmore currently manages an energy conservation learning center called the Sunrise House Education Program in Seattle and is also a coordinator for a summer apprenticeship program in sustainable agriculture at Libby Creek Farm, Carlton, Washington. After completing the Masters Program in Appropriate Technology at Antioch College in Seattle, he traveled through Greece on bicycle from the fall of 1981 to the summer of 1982.

The edible horticulture practiced on Greek hill farms follows a tradition that has existed for more than twenty centuries. It is a style of agriculture best suited to the marginal hill lands that comprise most of the Greek landscape. The goal of these hill farms is preserving soil health and preventing soil loss due to erosion. The hillsides are planted with fruit

Vertical farming: three levels of agriculture. The olive grove dominates the landscape, while sheep, goats and horses graze on the nitrogen-fixing clover beneath (page 14).
Photo: B. Wetmore

and nut-producing orchards that are widely spaced to allow for understory crops of legumes, grains, and vegetables. Diverse plantings stand in small fields made level by terracing. So intensively are these fields planted that they resemble lush gardens rather than field crops.

Would this type of farming work in the comparatively low-light coastal regions of the Pacific Northwest? I found the winter months in Greece strikingly similar to those in western Washington: plenty of dull, grey, wet weather. As it is so dry in Greece during the summer, most of the vegetables are grown through the fall, winter, and spring for an early harvest in June. The exact variety of crops on Greek hill farms varies greatly depending on the elevation. At higher elevations farmers choose crop varieties identical to those grown in much of North America. Their methods of using self-perpetuating or perennial plant varieties help retain soil and water and maintain the productivity of their hillsides. (We would do well here in North America to adopt an agricultural style for our hill lands which would produce a steady harvest for the next two thousand years.)

Where I live in the Pacific Northwest there has been a recent revival of interest in those farming and gardening techniques that have a regenerative effect on soil fertility, use land efficiently, and maintain a proper ecological balance. This revival has led to experimentation in agriculture based upon diverse perennial plantings, giving special attention to tree crops in an attempt to derive an ecologically-inspired agricultural landscape. An Australian named Bill Mollison has worked extensively in the field of regenerative agriculture and his books *Permaculture I & II* describe perennial agricultural systems as permacultures: "Permaculture is a word we have coined for an integrated, evolving system of perennial or self-perpetuating plant and animal species useful to man. It is, in essence, a complete agricultural ecosystem modeled on existing but simpler examples."

A few months before leaving the United States I attended a "permaculture" conference held near Portland, Oregon and spoke with people from all over the Northwest about the potential for creating diverse edible landscapes maintained in a continuing cycle of fertility and productivity. The impression I received from the conference was that there were a lot of earnest people willing to experiment with diverse plantings, but they had very little agricultural tradition to draw from. The purpose of the conference was the exchange of ideas, and many were exchanged, but there were far too few case examples.

Compared to Greek hillside farming, agriculture in the Northwest (at least the farming culture of the white European immigrants) is

too recent to allow for the existence of a traditional permanent agriculture. However, in some regions permanent agriculture is still practiced by the most ancient surviving cultures. These people farm in an ecologically sensitive manner that has taken centuries to evolve. They exist today only because they are supported by years of tradition and a strong sense of community.

I had once visited Greece briefly and caught a glimpse of the traditions in agriculture. I wanted to photograph and document these traditions. From Greece could be brought a graphic image of sustainable agriculture: evidence of several generations of people caring for the same grove of trees. I packed a camera, a journal, a bicycle, and I flew to Athens.

The appearance of Greek hillfarms is what makes Greece so beautiful a land. Patterns within the way of life allow for the expression of the hill farmer's health and vitality which is so common to the Greek personality. Great skill and ecological sensitivity have influenced the practices that have enabled their form of agriculture to survive since ancient times. Each generation cultivated the same rocky slopes, lived with recurrent drought, and confronted the many problems inherent in the Greek landscape. They found solutions in their patterns of living.

Greeks themselves are as much a part of their landscape as their farms. The Greek hillsides are reminiscent of ancient Chinese landscape paintings—there is always a human presence in the landscape, and the ratio of people to land is in appropriate balance.

Greek farming communities are small. Tight village clusters, often forming organic shapes as lichen will cling to stone, leave most of the available land for agricultural use. Most village families own a group of small fields scattered here and there along the hillsides; the steeper the land, the smaller the fields. Fields are made level by hand; stone walls are built as terracing to conserve water and prevent soil erosion. For generations villagers have shared both the maintenance of older stone walls and

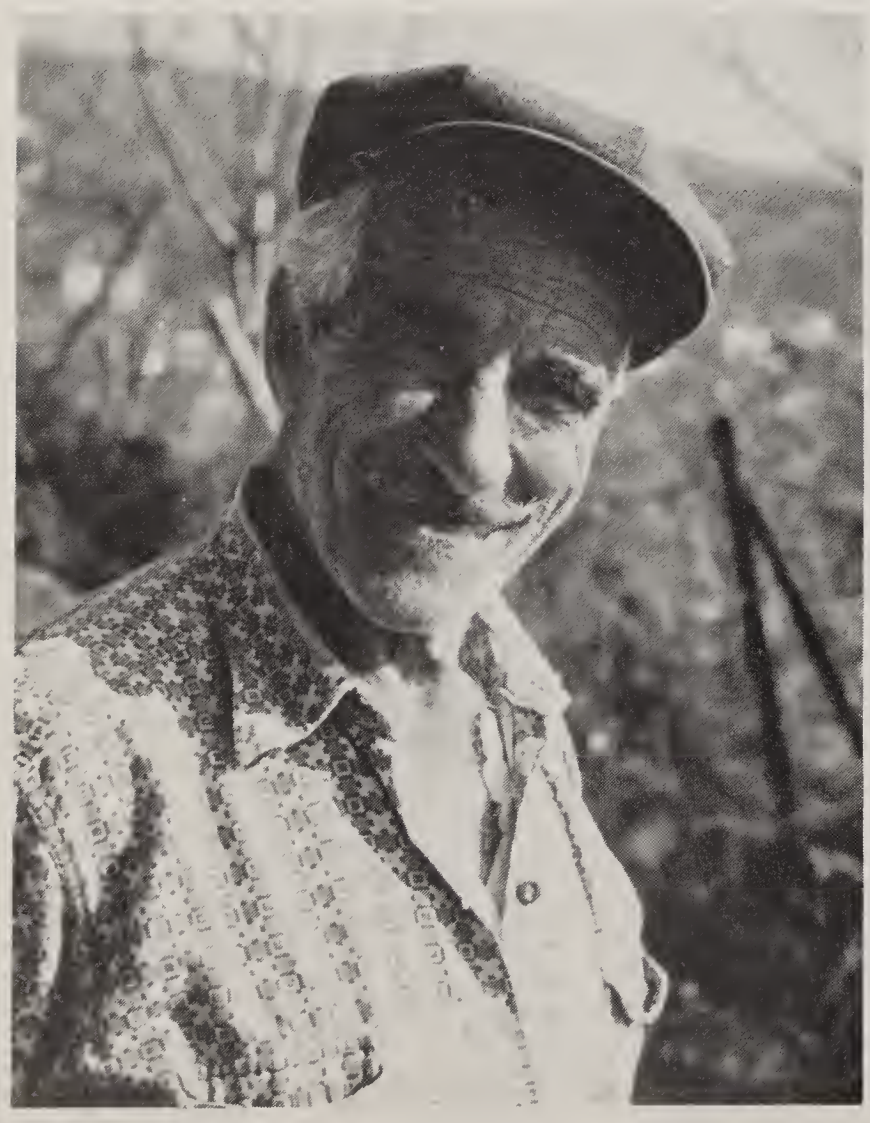
A winter scene of Agios Giorgios village in the Pelion peninsula, with sheep foraging beneath the fruit trees. Here, agriculture and the village are more integrated than is typical of island hillfarms. Although the houses of the village are clustered together, space is allowed for courtyards and gardens around the homes. Photo: B. Wetmore

the construction of new ones; now terraced fields cover entire mountain ranges.

The key to traditional Greek agriculture is diversity—nature's own system of checks and balances. A concentration of one plant variety, as in most monoculture farming, leads to imbalances in nature and invites problems of pests or disease. A variety of diverse plants, on the other hand, tends to ensure greater chances for a successful harvest as well as enriching its quality. (Families that work these hillsides eat much of what they plant; they have a vested interest in the quality of their produce.) In accordance with the principles of diversity, orchards are interplanted with understories of vegetables, low ground covers, grain crops, and small pastures. Not having the available land to plant large areas, each family intensifies production within the plots by using vertical space. A single field might have four levels of plants: beans or garlic planted above a living mulch of clover, shrouded by grape vines branching up into cherry trees. The plantings are integrated to benefit one another and many serve as forage for farm livestock.

Most hill communities depend upon the olive as their main crop. Villages often have vast forests of these gnarled trees. Shelter belts of cypress, pine, and oak flank the olive groves and their fine wood is used for building. The oak acorns are gathered for livestock feed. In the lowlands, citrus trees including orange, mandarin, lemon, and grapefruit are common along with other heat lovers such as figs, almonds, carobs, quinces, and pomegranates. At higher elevations the fruit and nut trees grown include peaches, pears, plums, apricots, walnuts, cherries, and chestnuts; the highest plantings are cold-hardy apple varieties.

Barba Jiannis (Old John), the herbalist who owns nothing and trades his knowledge for whatever he needs (page 16). Photo: B. Wetmore



The orchards are a symbol of permanence. The olive's pale color dominates the landscape and yet it coexists within a great diversity—alongside and underneath these stands are planted a mixture of plants which fill the basic needs of the community. Vegetables and grains are planted in rotation with leguminous ground covers that fix nitrogen in the soil and are a benefit to the trees. The term "planted" is used loosely here since none of the Greek plantings have any formal quality. It is important to appreciate the wild appearance of these fields. Only a few crops are put in rows with the help of a mule-drawn plow. Generally, row crops are limited to a portion of any given field. A typical understory might be one-third potatoes, one-third hay (for the mule), and one-third clover (a legume for the trees), all within an established orchard.

Most often vegetables are planted in thick patches and the hill farmer will let plants of each variety go to seed so that the following season they will "volunteer." It is common to find clusters of garlic, cabbages, beans, leeks, peppers, lettuces and more all growing together in unruly bunches. The patches are never weeded. Alongside the planted varieties are a wealth of wild edible greens and herbs which are encouraged to grow because they form one of the staples of the Greek diet.

The Greek name for greens is "horta," similar to our word "horticulture." It is the collective name for chicory, wild cabbage, fennel, asparagus, beetroot, borage and sorb thistle which all grow in proliferation during the rainy winter months. One of my greatest frustrations in trying to learn the identities of these wild green plants was having them all called "horta."

Olive harvest on the island of Crete takes place in December and January. Olives and leaves are knocked to the ground with a stick, and fall into a large net (upper left); the olives are kept, the broken and pruned branches are used for fuel, and the fallen leaves serve as fodder for mules. Olives for table use (upper right) are soaked for weeks in brine with garlic, salt and herbs, and become plump and tender. Olives for oil (below) are bagged and loaded onto a pack animal, and sent to a water-powered mill to be pressed. The residue of pressed pulp is burned as fuel for stoves. The olive groves, in this case situated a mile or two up a valley from the village, are on land common to the village; an extended family farms a specific portion. Photos: B. Wetmore

Typical hill farming in the Pelion region—a peninsula with a central mountain range and many villages. Fields are terraced with stone walls; young trees each are furnished with a reservoir around the base of the trunk. Photo: B. Wetmore

Thyme and sage are two of the most common wild herbs whose fresh scent is an inseparable part of the Greek landscape. In writing about his life, Nikos Kazantzakis, author of *Zorba the Greek,* told how the smell of thyme was ingrained in the memory of his home island of Crete. During the fall I lived on the south coast of Crete. In a village that lay on both sides of a narrow valley I negotiated a successful trade for my housing: the owner of an abandoned cottage allowed me to stay there in return for cleaning it and doing small repairs. The house was a one-room stone dwelling built into the side of a hill. It had a flat clay roof and opened to the south and the sea.

Below my front terrace lived a wonderful old man named Barba Jiannis. He knew all the wild edible plants. On my walks through the countryside I would collect plants I could not identify and bring them in to Barba Jiannis. He would tell me the plant's name in Greek, describe its uses, and then tell a tale from history or mythology in which the plant played an important role. He knew what time of year to collect each variety and which regions of the country had a greater diversity. "Around here is not so good especially at this time of year. In spring I am going to the Peloponnesos. You should come with me if you want to learn these plants."

His understanding of plant uses was exceeded only by his knowledge of their place in history. Once I brought him some nightshade. "This is a poison," he said, "Nightshade was used in the attempts to kill Rasputin. After being given enough poison from this plant to kill a mule he was still alive so his assassins shot him and still uncertain of his death, threw his body into the river. What they didn't know was that one of the antidotes for nightshade is honey. Rasputin took nightshade as a tea mixed with honey. Of course it did nothing to him."

Barba Jiannis' kitchen was littered with bottles of different medicinal aids. Some of his mixtures, like pomegranate juice, were natural intoxicants. He billed several others as aphrodisiacs. This made him a controversial but very popular person in the community. The men of the village visited him regularly.

Among the greens and herbs and other wild plants, producing a spectacular display, were the wildflowers. In spring brilliant red, blue, orange, yellow, and white flowers filled the orchard fields. Wild flowers support bee colonies who busy themselves with making honey and provide a second service of pollinating the orchards. The infinite variety of these wildflowers coupled with the color and fragrance of the fruit tree blossoms make springtime in the Greek hill lands almost too much to bear.

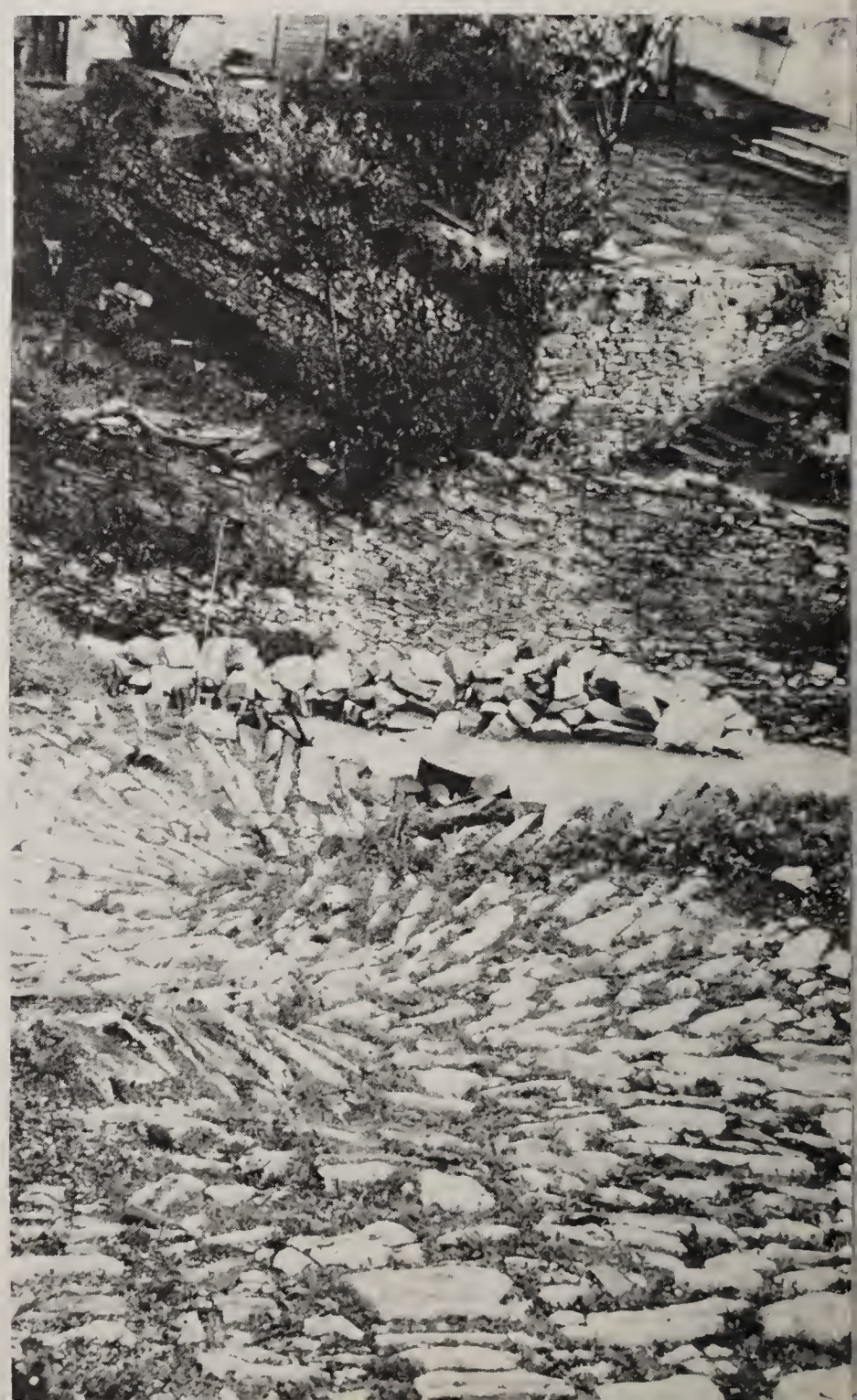
There is one more vital understory crop that makes each village unique unto itself—the grape. Every farm in Greece has a grape arbor. Through summer and fall, grape-laden trellises shade the southern facades of every Greek home. In the orchards grapes are the middle story. The fruits are dried to make raisins or pressed for wine. Each family produces its own. The strongest-tasting Greek wine is their retsina, which some have compared to turpentine. At one time retsina was made in pine barrels and acquired its resinous

Giorgios and Irenie: traditional Pelion hill farming at its best. In their seventies, these people have the best land and the best farm in the village, and take an active interest in politics and village life (page 19). Photo: B. Wetmore

Giorgios' peach tree, enjoying its mulch of hay and manure from the stable. The reservoir around the base of the trunk serves to prevent erosion and loss of water (page 19). Photo: B. Wetmore

The rocky soil of the Greek hill country.
(Above) Near the oracle of Delphi, on the north side of the Gulf of Corinth, a woman plows the stony ground with the aid of a horse and mule together—usually an uneasy partnership. She will plant potatoes among the olive trees.
(Left) A terrace wall with steps built in. Walls such as these constitute some of the most impressive examples of masonry work in Greece.
(Below) This beautiful curving pathway contributes to the pastoral charm of the hills. Such paths are built as pedestrian-ways: they please the eye as well as the foot.

Photos: B. Wetmore



flavor from the pine wood. But with the advent of metal and plastic containers pine resin is now collected and added to the wine.

The aim of Greek hill farms, then, is to produce a biologically diverse agriculture while keeping within the carrying capacity of the land. Greek farmers understand the limits of their fields and the relationship between crop variety and place. Their agriculture contains an ordered diversity which increases the chances for a successful harvest: one failing crop is not so tragic among many others that thrive. Their plantings are primarily self-perpetuating and each is an integral part of a whole system.

Pedaling through the hill country I met many villagers whose lives were tied to their land. In the spring I lived in a small village that perched high along a mountain peninsula known as the Pelion. My closest neighbors, Georgios and Irenie, farmed some of the best fields of the village. They had peach, cherry, and walnut orchards along with a profusion of understory vegetation including garlic, onions, beans, potatoes, and "horta." They kept two dairy goats that Irenie would tend and a horse and a mule in the stable. Georgios and Irenie were both in their seventies. They had ageless features and were more alive than many young people I know. Their farming practices are so old that the wisdom which brought them into being could no longer be separated from the practice itself. For instance, asking why they planted certain companion crops together never produced a direct response.

As I followed Georgios through his spring rituals of cultivating, pruning, and planting I asked about the processes that were unfolding before me. One day in exasperation he responded with, "Listen, do I ask you why the sky is blue?" He shook one of his trees and then picked up a handful of dirt. "My trees are here with this earth because it is good for them to be here. I know this is so because I have sat here with them for many years. Over here I grow hay and there I grow greens. My horse will eat those and his manure I put under my tree. The earth likes this and my trees like it too. In the fall my tree tells me how good things are by giving me fat peaches." Georgios understood the natural associations between

A no-cost aid for cherry picking—an orchard ladder made of poles from the orchard itself (page 20).
Photo: B. Wetmore

his plantings and their location. Combinations of plant varieties and the timing of crop rotations all had been carefully worked out on that spot centuries ago. The traditions behind his practices were given to him by his ancestors and he has gracefully accepted his inheritance. Georgios' farming is a continuation of a way of life created long before the temples of the Acropolis.

Along with a physical and spiritual attachment to the land, Greek villagers feel tied to their seasons. Their livelihood depends upon these variations. Among hill or mountain communities there are certain basic rural attitudes which are prevalent throughout Greece. These shared feelings are derived from a lifestyle based on seasonal patterns. They place the traditional hill farmer apart from his urban-dwelling counterpart. City dwellers' lives are more transient and they miss all but the most obvious seasonal changes. City time progresses in quick succession of days and nights and is measured by the rotation of the earth on its

axis rather than the more gradual but grander movement around the sun. People of the hill country live where the seasons are strong. They have no need to travel. They may stay at home and let change come to them.

A hill farmer's life follows a steady, controlled rhythm. His approach to life is made evident from the practical articles he possesses such as the tools he uses. Take the example of a hand-made tree ladder. This simple tool is a no-cost solution to pruning and harvesting. A craft of necessity, it is both plain and elegant. The wooden parts of this tool came from the orchard it serves. It reveals the pace of the orchardist's life. It is not built for speed.

If you ever pick apples in a mechanized North American orchard, you will be equipped with a factory-made ladder and placed in rather fast competition with other pickers. Your reason for being will be translated into six bins a day. You and the other pickers will work day after day in grove after grove picking one variety of fruit. You will swarm over the trees harvesting apples as quickly as possible.

The fruit grower using a handmade ladder has a different rhythm. Today he picks cherries but tomorrow it may be something else. He works with his family: his children and his grandchildren. His plantings are diverse. His fields are beautiful gardens. He arrives at his fields on horseback and he carries away his harvest with the help of a mule. Six bins a day is not relevant to his lifestyle.

Unfortunately, the traditional lifestyle in Greece is fast disappearing. The healthiest hill farms that I visited were maintained by people over the age of sixty-five. Young people have rejected the "peasant" culture they were born into and they regard their parents' ways as ignorant and backward. Within one generation the ties to their land and village have been cut. I feel most fortunate to have witnessed the spirit and vitality with which the remaining hill farmers live. This spirit is probably the most outstanding characteristic they hold in common with their ancestors. Immensely open and incredibly hospitable, the elders of the hill towns continue a celebration of life; a celebration that has lasted two thousand years.

A 2000-year-old celebration of life: two Pelion women shelling peas in the shade of an orchard tree.

Photo: B. Wetmore

Rhododendron's Curious Kin

*MARY ALICE SANGUINETTI**

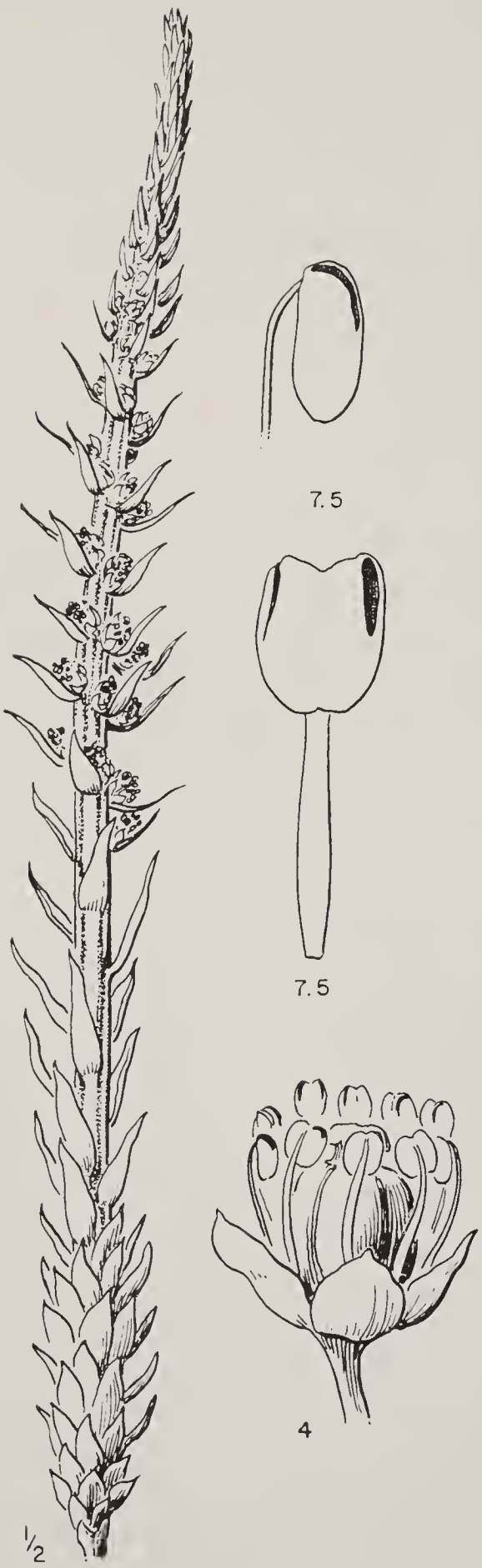
Editor's Note: Although the chlorophyll-lacking members of the heather family (Ericaceae) cannot be grown in gardens, they adorn our coniferous forests and surprise us with their unexpected beauty. Summer and autumn are the seasons to search for these unusual plants in the Pacific Northwest.

The Ericaceae, or heather family, of which *Rhododendron* may be the most conspicuous genus, is well represented in gardens of the Pacific Northwest. *Rhododendron,* heather, laurel and *Pieris* are all favorite and familiar horticultural choices. Less well-known are some of the heather family's chlorophyll-lacking genera (achlorophyllous ericads) which may be encountered in North American forests. While most flowering plants contain chlorophyll that enables them to conduct photosynthesis, these anomalous ericads, living deep within dark coniferous forests, depend upon mycorrhizae (fungal hyphae surrounding the roots) to bring them sugars and other organic compounds. Although the nutritive systems of some genera have not been thoroughly investigated, it has been shown for several that the fungal symbiont of the mycorrhiza is also connected to a nearby conifer. This situation, in which a green plant (the tree) provides organic compounds to a chlorophyll-lacking plant by means of fungal strands connected to both root systems, is called mycotrophy.

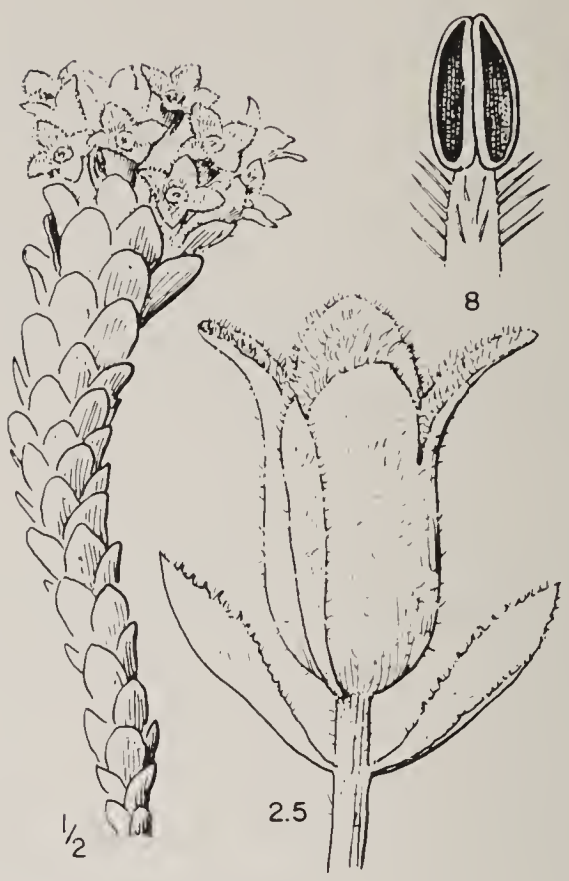
Achlorophyllous ericads include ten genera: *Allotropa, Cheilotheca, Hemitomes, Monotropa, Monotropastrum, Monotropsis, Pityopus, Pleuricospora, Pterospora,* and *Sarcodes.* These ten are commonly grouped together in the sub-family Monotropoideae and will be discussed in this article. The genus *Monotropa* is divided into the two genera *Hypopitys* and *Monotropa* by many botanists, including Hitchcock. Others place the two species in question both in the genus *Monotropa;* this classification is being followed here. *Pyrola,* wintergreen, usually placed in the sub-family Pyroloideae, may be a transitional genus in which some species have green leaves and others apparently lack them; there is some controversy about its taxonomic position within the Ericaceae. The lack of green leaves has caused *Pyrola* to be considered by some authors as closely related to

A flowering stalk of candy stick, *Allotropa virgata* (page 25). Photo: M.A. Sanguinetti

*Mary Alice Sanguinetti, Seattle naturalist and author, was first introduced to the achlorophyllous ericads when she attended Camp Fire camp at the age of eight. Snow plants *(Sarcodes sanguinea)* were sometimes found near the Sierra Nevadan camp and campers were told of their rarity and that the common name was related to their habit of appearing immediately after the snow had melted.



Allotropa virgata



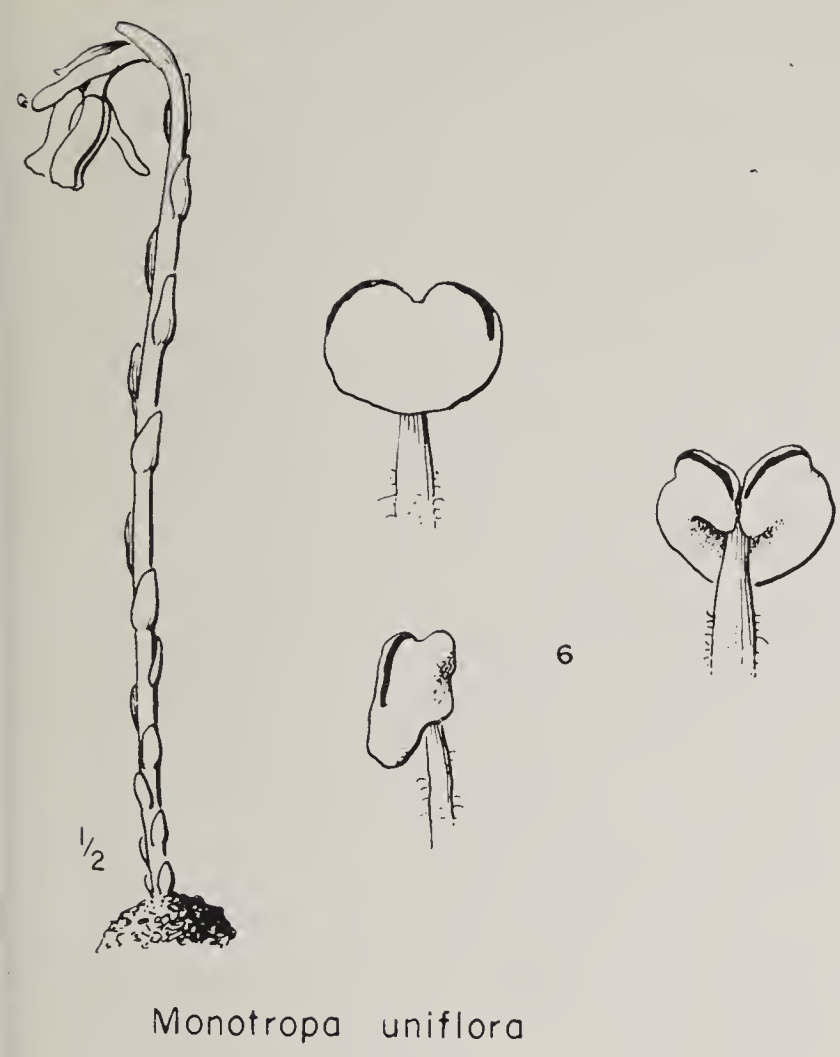
Hemitomes congestum

Achlorophyllous members of the Ericaceae (clockwise from

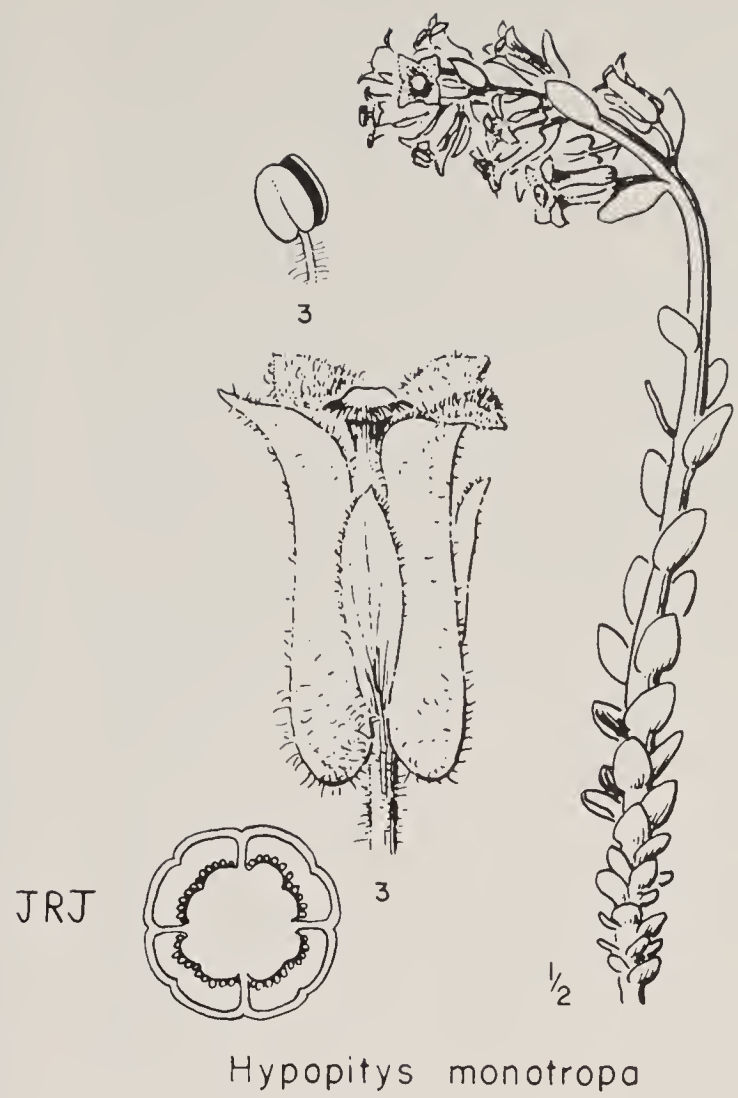
Allotropa virgata, candy stick: flowering stalk, flower and sta
Hemitomes congestum, gnome plant: flowering stalk, flower
Monotropa uniflora, Indian pipe: flowering stalk and stamen
Hypopitys monotropa (Monotropa hypopithys according to
section of ovary
Pterospora andromedea, pinedrops: flowering stalk, stalk in
Pleuricospora fimbriolata, fringed pinesap: flowering stalk, f
Pityopus californica, pine foot: flowering stalk, flower, stam

Drawings from Hitchcock, C.L. *et al., Vascular Plants of the*
Washington Press, Seattle.

Pityopus californica



Monotropa uniflora



Hypopitys monotropa

eft; numbers refer to the magnification of the structures)
ıs
stamen

ace), pinesap: flowering stalk, flower, stamen and cross-

e parts with fruits below, flower and stamen
rs, flower and stamen
nd cross-section of ovary

fic Northwest, Part 4, 1959. Courtesy of the University of
Drawings: Jeanne R. Janish

Pleuricospora fimbriolata

Pterospora andromedea

the Monotropoideae, but anatomical differences argue against so close a relationship.

Genera of the Monotropoideae are generally found on shady forest floors. The plants lack leaves, sending up one or more flowering axes or stalks from their perennial root masses. These axes and their variously-arranged bracts and flowers range in color from white or cream through yellow, pink and red to brown; they are never green or blue. Many hikers in northern forests have probably encountered the waxy white Indian pipe *(Monotropa uniflora)* or its widely distributed relative *Monotropa hypopithys (Hypopitys monotropa),* pinesap. Woodland pinedrops *(Pterospora andromedea)* are sometimes found in luxuriant rusty-red clumps near conifers in western forests while the brilliant scarlet snow plant *(Sarcodes sanguinea)* seems exotic in Sierra Nevadan pine forests. *Hemitomes,* commonly known as gnome-plant or cone-plant, resembles a Douglas fir or hemlock cone standing on the ground with its scales pointing upward. *Allotropa,* candystick, is conspicuous because of its longitudinally-striped red and white stem. The Asian *Cheilotheca* and *Monotropastrum* and the North American *Monotropsis, Pityopus* and *Pleuricospora,* rare plants which have been little studied, also consist of flowering axes covered with bracts.

We will consider first the most familiar of these plants, several of which are found in the Pacific Northwest, and conclude with those which are less well known.

Monotropa

The most thoroughly-studied achlorophyllous ericads are *Monotropa uniflora* and *Monotropa hypopithys (Hypopitys monotropa* in Hitchcock) found in Europe, North America and Asia. These two species were well known in Europe at the time of Linnaeus. The flowers, borne singly in *M. uniflora,* and in a raceme in *M. hypopithys,* vary in color from white or cream to pink, reddish, yellow or brownish. The corolla has 3 to 6 separate petals. The somewhat fleshy inflorescence is slender; the root system may be composed of a dense clump of short roots or a more open mass of longer roots.

Besides being well known, these two species (especially *Monotropa hypopithys)* are abundantly named; Wallace (1975) lists 85 synonyms for *M. hypopithys* alone and 13 synonyms for *M. uniflora.* Most of these synonyms result from the fact that specimens were often studied and named in isolation where the researchers lacked the opportunity to compare other material.

Elias Fries, in 1832, was the first to observe that roots of *Monotropa hypopithys* are normally enveloped by fungal hyphae, and in the early 1880's the German botanist Kamienski definitely established that *M. hypopithys* lives without direct connections to tree roots.

Bjorkman surrounded plants of *Monotropa* with metal cylinders in the ground and observed that they grew poorly when isolated from neighboring green plants. He further studied the nutrition of *Monotropa hypopithys* by injecting C^{14}-labeled glucose and P^{32}-labeled inorganic phosphate into the phloem (sugar-transporting tissue) of nearby spruce and pine trees. He found that carbohydrates derived from the trees were absorbed by plants of *M. hypopithys* beneath. Bjorkman hypothesized that the mycorrhizal fungus of *M. hypopithys* was probably the same as that of the trees with which it is associated.

Although *Monotropa hypopithys* is achlorophyllous, it reaches full size in a very short time, after the main shoot and leaf growth of associated trees is completed. For this rapid growth *M. hypopithys* needs access to large amounts of energy in the form of soluble carbohydrates. These carbohydrates move through mycorrhizal fungi from trees to *M. hypopithys.*

Monotropa uniflora, less widely distributed than *M. hypopithys,* has been most frequently collected in eastern North America and Canada. In this species fungal hyphae both ensheath the root peripherally and penetrate between and into the cells of the epidermis.

Lutz and Sjolund (1973) studied in detail the mycorrhizal habit of *Monotropa uniflora,* using the light microscope, scanning electron microscope and transmission electron microscope. They observed mycorrhizal features that apparently enhance the flow of nutrients from the fungus to *Monotropa.* This may be a key to the loss of chlorophyll during the evolution of *Monotropa:* perhaps *Monotropa* evolved from a green plant that developed

such an efficient mycorrhizal relationship that it was able to acquire carbon without photosynthetic activity.

Pterospora

A monotypic genus found in almost all coniferous forests of temperate North America is *Pterospora andromedea,* or woodland pinedrops. Often a cluster of the tall, slender racemes will be found adjacent to a tree trunk in a dry, semi-shady woods. The stem color may range from pinkish to a rusty red while the graceful urn-shaped, pendent flowers are cream colored or white. With stems which may reach over a meter in height this is the tallest and one of the most conspicuous of the a-chlorophyllous ericads.

In the late 1950s Trilochan Bakshi studied the ecology and morphology of *Pterospora andromedea* in eastern Washington and Idaho. The plant had sometimes been assumed to have its roots connected to those of other vascular plants but Bakshi was unable to find any organic connection supporting this assumption. He did find an unbroken mycelial sheath around each root, preventing any direct contact of *Pterospora* with the soil. Unsuccessful attempts to isolate the associated fungi suggest that they were "true mycorrhizal taxa which have some dependence on the vascular plant."

Bakshi also attempted unsuccessfully to germinate some of the numerous minute seeds produced by *Pterospora.* Their failure to germinate under a number of different laboratory conditions may indicate the need for the mycorrhizal symbiont and for other specific conditions which sometimes occur in nature.

Sarcodes

Short, stout scarlet snow plants *(Sarcodes sanguinea),* said to appear shortly after the snow melts, are found in coniferous forests of the Sierra Nevada mountains, eastern California, western Nevada, southern Oregon and Baja California. The brilliant red of this thick-stemmed plant is striking when encountered on the shady pine-forest floor. Its lack of chlorophyll makes the plant appear superficially fungus-like.

Closer observation reveals the typically ericaceous, urn-shaped flowers and small red, scale-like leaves. Each of the roots, which form a thick branching ball, is surrounded by a dense mat of hyphae. Stems of the plant may occur singly or in clumps.

It has been hypothesized that *Sarcodes sanguinea* might receive nutrient support from nearby trees through a species-specific fungus. This hypothesis was tested by injecting four species of trees, *Pinus murrayana, P. jeffreyi, Abies concolor* and *Populus tremuloides* with radioactive phosphorus (P^{32}) and then testing nearby *Sarcodes sanguinea* and other plants for the presence of P^{32}. The significantly greater presence of P^{32} in *S. sanguinea* than in other nearby plants suggests the sharing of a fungus by the mycorrhizae of the snow plants and the injected trees. Because the rate of P^{32} translocation was almost twice as great for *Abies concolor* and *Pinus jeffreyi* as for *P. murrayana* and *Populus tremuloides* the first two species appear to be the most important in the growth of *S. sanguinea.*

Hemitomes

Hemitomes, cone-plant, like *Pterospora* is a monotypic genus of western North America. It is a short, inconspicuous plant with axes 2 to 10 cm high ranging in color from cream to pink or reddish. Each raceme may have from one to several urn-shaped corollas surrounded by bracts; the bracts give the plant its cone-like appearance. As plants age and become dry they become brownish. *Hemitomes congestum* is found in coastal areas in colonies of as many as twenty plants. It is best known in the redwood forests of Northern California where it grows on humus at 2,500 feet. However, the species has also been collected in the Sierra Nevada mountains, as far south as Tulare County where it grows at an elevation of 8,400 to 8,700 feet on the relatively dry open floor of a red fir forest. It is rarely found as far north as British Columbia where it is most common on Vancouver Island.

Allotropa

Allotropa virgata, candy stick, was first collected in the Cascade Mountains of Washington Territory by Pickering and Brackenridge who were part of the United States Exploring Expedition commanded by Captain

Wilkes from 1838 to 1842. The plant has white campanulate flowers with separate petals borne on a spike-like inflorescence. The stalk which may reach 50 cm is found in mixed or evergreen forests between 250 and 11,000 feet in California, Oregon, Washington, Idaho and British Columbia.

Asa Gray described the species in 1868 and discussed its structure and phylogeny. The botanist H.F. Copeland studied it in the 1930s and 1940s, noting that its roots lacked root hairs, but he failed to find mycorrhizae.

Monotropsis

Apparently restricted to forests of the eastern United States below 5,000 feet is *Monotropsis odorata,* also known as sweet pinesap and Carolina beechdrops. The inconspicuous racemes are somewhat crowded and one-sided. They are 4 to 13 cm tall and the color varies from violet to purple. The shallow perennial root mass forms a diffuse mat which is mixed with a few roots of other species. The inflorescence is quite fragrant when in full bloom which may explain the common name, sweet pinesap. It has been infrequently collected in Tennessee, eastern Kentucky, North and South Carolina and Virginia and the range is poorly known. This may be partly because the low, dark colored stem covered with dry, brown membranaceous bracts blends in with the surrounding leaf litter. It is reported to have been located by its spicy scent which is similar to that of violets.

Pleuricospora

Pleuricospora fimbriolata has been found only in California, Oregon and Washington with possible collections from Mexico and British Columbia. It is another inconspicuous plant with thick succulent racemes from cream to yellow, and a shallow root system. *Pleuricospora fimbriolata* grows in mixed coniferous forests at elevations from 500 to 9000 feet, with dense cover. The form of the inflorescence varies from a condensed regular raceme to an occasional single flower.

Pityopus

Pityopus californicus (the *Monotropa californica* of Alice Eastwood) is the least known North American member of the Monotropoideae. It is an inconspicuous plant found in coniferous forests between 100 and 6,000 feet and collected fewer than 20 times in western Oregon, northern California and the Sierra Nevada mountains. The plant sometimes looks much like *Monotropa hypopithys* although *Pityopus* has berry-like fruits and ovoid seeds held within a sticky mass in the fruit while *M. hypopithys* has capsular fruits and dry, spindle-shaped seeds.

Asian Species

The two species of *Cheilotheca,* formerly known as *Andresia* or *Wirtgenia,* are very rare plants found in India and on the Malay Peninsula. *Cheilotheca khasiana* has been collected only once, in 1850, at an elevation of 5,000 feet in the hills of western Assam, India. *Cheilotheca malayana* has been collected at elevations of 2,000 and 3,000 feet in Perak state, Malaysia. Both plants have shallow root masses and short racemes, 8 to 10 cm high, bearing one to a few flowers on a stout white, reddish or purplish stem. Wallace (1975) does not give flower color for these species and it is likely that this is undetermined, the descriptions being based upon herbarium specimens in which color is often distorted. Very little is known about the habitat or physiology of these species.

The other Asian species is *Monotropastrum humile* in the monotypic genus *Monotropastrum.* This plant has frequently been confused with *Monotropa uniflora* and *Cheilotheca khasiana,* both of which it resembles. Numerous specimens have been collected from Japan as well as from southern Asia but collectors have rarely included notes on habit or associated species and the range is poorly known.

The complex ecological conditions required by these ten genera of the Ericaceae and the seeming impossibility of germinating their seeds under laboratory conditions are evidence of the unique nature and irreplaceable value of our native old-growth forests. While the chlorophyll-containing ericads are grown in gardens for their attractive green foliage, showy or dainty flowers, fruit and fall color, the curious achlorophyllous genera are found only in established native forests. Despite

differences in habit and habitat their relationship can be appreciated by comparing the dainty clusters of urn-shaped flowers on a city *Pieris* in spring to those of pine drops found in a dry conifer woods on a hot August day.

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News from Urban Horticulture

Seattle attorney Pendleton Miller has pledged a gift of $488,000 to the University of Washington in support of the construction and development of the Elisabeth C. Miller Horticultural Library in the planned Center for Urban Horticulture on the University of Washington campus near Union Bay.

The library will be built in recognition of the civic contributions of Elisabeth Carey (Betty) Miller, Pendleton Miller's wife, who is prominent in community and horticultural affairs. A regent of the University of Washington in 1980, Mrs. Miller is one of the founders and leaders of the Northwest Ornamental Horticultural Society, and has been associated with the Pacific Science Center, the Rhododendron Species Foundation, Bloedel Reserve, the Lake Washington Ship Canal Project, the Carl English Gardens at the Chittenden Locks in Seattle and the American Horticultural Society.

The gift provides for library construction and furnishing, the endowment of a librarian position and funds for future book acquisition and library development. The University's collection of horticultural books thus housed will serve as an important resource for the University and for horticulturists in the region.

Pruning Reminders

Shrubs which should be pruned during the summer include those kinds which flower in the spring or early summer on shoots made the previous year. These include the forsythias, early spiraeas such as *Spiraea thunbergii, S. arguta* and *S. vanhouttei,* the flowering plums and apricots (forms of *Prunus cerasifera,* the Japanese *P. mume* and its attractive hybrid *P.* x *blireiana)* and crabapples and cherries *(Prunus subhirtella* and its varieties 'Accolade', 'Yoshino' and 'Akebono'). With these small trees it is important to eliminate crossing branches and thin them out where too many are filling the center of the tree.

In the case of the shrubs, removal of the old flowering branches wil encourage the growth of new shoots to flower next year. Also in this group are all the mock oranges *(Philadelphus)* and deutzias that flower in May and June, *Kerria,* brooms *(Cytisus)* and weigelas. It is not always necessary to remove the entire old branch if a vigorous new one arises from some lower point on it. Winter-flowering heathers *(Erica herbacea,* formerly known as *E. carnea,* and forms of *E.* x *darleyensis)* should be trimmed at this time, but only the old flowering shoots. Other kinds of heather should not be pruned until early spring.

Some of the oldest branches of old lilac bushes should be removed regularly, though not necessarily every year, and not always the entire limb. Again, this will encourage growth of more vigorous young shoots and tend to restrain the upward growth of the plant. Shoots which have flowered can be removed immediately after blooming, to avoid the drain on the plant caused by production of seeds.

BRIAN O. MULLIGAN

Mr. Minoru Takahashi, in the Japanese Garden, July 1977. Photo: Joy Spurr

In Memory of Minoru Takahashi 1891—1983

Mr. Minoru Takahashi has been gardener in the Japanese Garden since 1968, when he was 77 years old. Members of the Arboretum Foundation may remember his return to Japan in May of 1979 to celebrate his 88th birthday, "bei-ju," the rice anniversary. (This occasion derives its name from the similarity of the Japanese characters for "88" and for "rice.")

Mr. Takahashi has been greatly missed since his retirement in December of 1980. He has been such an integral part of the Japanese Garden, and his absence will be a source of sorrow to many of us.

Wild Ducks

I see him go
his head bowed low
his ancient face fondly fixed
upon the seven stepping-stones.
He goes to a clearing beneath black pines.
Wild ducks rush to meet him.
They know his wish.
Their dance brings the wisteria to flower.
The dance is the poetry of paradise.
Today the clearing beneath the pines is empty.
The seven stepping-stones go uncrossed.
In the shadowy gray morning mist
wisteria blossoms are falling.
Can you hear the ducks calling?

EDNA KOVACS

(reprinted by permission of the author from the newsletter of the Japanese Garden Society of Oregon, Spring 1983)

Friends of the Japanese Garden

The Prentice Bloedel Unit 86 is sponsoring a new unit to be known as The Friends of the Japanese Garden. Membership will be offered to all those who want to assist the Parks Department in maintaining the authenticity of the Japanese Garden and its Tea House. Briefings, demonstrations and special events appropriate for the Garden are planned for members.

The new unit provides a response to the call from the Seattle Department of Parks and Recreation to "Adopt a Park." Unit 86 has formally "adopted" the Japanese Garden in Washington Park.

For further information please phone the Arboretum Foundation Office at (206) 325-4510, or Leroy Collins at (206) 232-5258.

A vine of *Akebia quinata* with fruits, in a Seattle garden. Photo: B.O. Mulligan

My White *Akebia* from Japan

*JERRI SPALDING FREDIN**

While touring a local garden with some Arboretum friends over twenty years ago, I sensed a delightful fragrance and spent some time looking for the plant that was its source. Even after our guide pointed out the vine of *Akebia quinata* blooming on a post near me, it took a few minutes to discover the inconspicuous, tiny purple flowers. At the time I had no way of knowing how much knowledge I would eventually acquire because of my sense of smell, the unique fragrance of *Akebia quinata,* and a woman who had shared the beauty of her garden.

The fragrance was so tantalizing that I decided I wanted to learn more about the plant. After realizing that my gardening friends knew little more than I did, I turned to some of my garden books. One writer states that the vine "might be likened in design to a paisley shawl." Indeed, against a wall or flat surface the layering of the five-parted leaves resembles a lacy paisley pattern. Furthermore, "its quaint, secretive blossoms, dully purple, are more in

* A member of the Arboretum Foundation since the 1960s, Jerri Spalding Fredin served as the first slide program chairman for the Unit Council, and compiled the program on winter bloom.

the nature of a surprise than a show." (Sunset Western Garden Book, 1st edition, 1954). My first impression was that we had each discovered the plant through our sense of smell, although the author does not mention fragrance. Bean (1976) describes the species of *Akebia* as twining shrubs which produce male and female flowers in the same flower cluster. The male flowers are small and numerous, the few female flowers larger and confined to the base of the raceme. Neither is showy, for petals are absent and the attractive part consists of three large sepals. In contrast, the fruit is large and highly colored. These vines are chiefly attractive for their free growth and elegant foliage, and *Akebia quinata* is also "valued for the charming spicy fragrance of its flowers at times perceptible yards away from the plant." In any event, the plant's fragrance and leaf pattern were enough to convince me that I wanted to have an *Akebia quinata* in my garden.

It was quite a coincidence that before I was able to find a plant locally, I learned that my husband was planning a business trip to Japan, where *Akebia* is native. When he asked if there was anything special that he could bring me, I thought about *Akebia* and also about the many other Japanese plants that grow well in the Seattle area. Most of the plants my husband brought home were in the form of seeds because, as I was to learn, few plants survive the fumigation required by law—a process intended to kill insect pests. The *Akebia* was the only growing plant to survive the quarantine procedure. Consequently, I learned that besides being unusually fragrant, *Akebia* is unusually tolerant to fumigation.

Although the naked stem (about ten inches long with dried-up roots) looked as though it were dead, I plunged it into the soil near my door and in the spring was surprised to see leaf buds forming. Three years passed before the first flower buds appeared. When the flowers began developing I was again surprised—they were cream-colored instead of the purple I had expected; only the stamens and pistils were lavender. Joseph Witt of the Arboretum assured me that the flowers would turn purple as they continued to develop, but two weeks later when they remained cream-colored, even Mr. Witt was surprised.

After Mr. Brian Mulligan (then Director of the Arboretum) had checked through his plant and seed catalogs from Japan and found no white akebias listed, Mr. Witt mentioned that they would appreciate having a start of my vine for the Arboretum. So, when a few seed pods developed on my plant, I took one to Mr. Witt who, without saying a word, immediately proceeded to eat some of the inner fleshy part of the pod, the part in which the seeds are suspended. As I stood there, somewhat startled, he offered me a sample. Hesitantly, I tasted it and was surprised. Quite sweet, its delicious flavor reminded me of the unusually flavorful watermelons which my grandmother had grown in her Iowa garden, a garden surrounded by a grove of pine trees. (The melons grown in that garden were always more flavorful than the same kind of melon she grew in another garden which was neither shaded by the pines nor had pine needles in the soil.)

Since then I have shared seed pods with other gardening friends. The next to receive a pod was a friend whose father had been a businessman in Iowa. She in turn gave some of her seeds to Ruth Vorobik, an acquaintance of ours, who still shares with me an interest in this plant, now over twenty years old, and in its many seedlings.

It has become evident that the seedlings of my *Akebia* are almost identical to the parent plant even though they have been raised in several different gardens. One friend observed that her cream-colored seedling produced many more stolons at the soil level than did the purple *Akebia*. At first I thought that this might have been due to the difference in age between the two plants, but my original plant continues to sprout stolons at the soil level. I now have a group of seedlings in a well-contained part of my garden, were they serve as an excellent groundcover. In other parts of my garden the stolons have proved invasive, using their petioles as tendrils and rapidly creeping up the main branches of my shrubs. With their rapidly growing tips, the vines tightly encircle the trunks of the shrubs and soon reach their tops. When the growth tip does not come in contact with something which it can encircle, it encircles itself; thus in

groundcovers, the vines become interwoven.

The form of *Akebia* that I have differs further from the purple *Akebia quinata* in that every year since it began blooming the original plant has formed seed pods, and I have not hand-pollinated it since the first year. As to why the purple form appears to produce many fewer pods than the cream-colored variety in the Seattle area, I first thought that it might be due to a too-early bloom. But after planting a purple form nearby I learned that the cream-colored *Akebia* blooms about three weeks earlier than the purple! Bean (1976) speculates than *Akebia quinata* is wholly or partially sterile to its own pollen and requires pollen from a plant of another clone or species. At Dyffryn Gardens, Cardiff, a plant of *A. quinata* grown in isolation for forty years has never produced fruit, while a vine situated near a vine of *A. trifoliolata* produced fruit in abundance. Flowers which remain unfertilized emit a strong fragrance for as many as eight days or until the flower withers and falls, but once pollinated cease to exude fragrance, often in less than half an hour.

While the cream-colored variety that I have produces a flower that is more visible from the standpoint of color, repeatedly produces seed pods, and makes good groundcover, it has almost no fragrance—the one quality I had most desired. In 1976 I visited the Tokyo University Botanical Gardens where I asked if white akebias were being grown. I was surprised to learn that there was not only a white *Akebia* in Japan but that it was also fragrant! However, it was in a private garden and was not available to the public. I did learn that lovely handwoven baskets are created by the Japanese from the very tough and durable *Akebia* vines.

Perhaps I may never have a fragrant white variety in my garden, but I will continue to enjoy and appreciate the individual characteristics of my *Akebia*. Sharing the seed pods, in particular, has stimulated friendships with several individuals who are interested in the entire life cycle of the plant—its cream-colored blossoms whether fragrant or not, and the reproduction of the plant through its seeds.

Life Members of the Arboretum Foundation

We wish to express our sincere appreciation to the following members who have increased their commitment to the Arboretum Foundation to that of Life Members: Colonel and Mrs. Leroy P. Collins, Jr., Mrs. Edward P. Ellis, Mr. and Mrs. Eric C. Frankel, Mrs. Moritz Milburn, Mrs. Jack Most, Dr. and Mrs. G. Pirzio-Biroli, Mr. and Mrs. John S. Robinson, Mrs. Casimer E. Vorobik.

Volunteer Opportunities in the Arboretum

The Arboretum counts on its volunteers to keep many important programs on track. Our OFFICE VOLUNTEERS each come once a month, making it possible for the staff to meet other responsibilities. We should like very much to add to our list of substitutes, and often new regular office volunteers are selected from the substitute list.

Another category of volunteers who render invaluable service to the public are the ARBORETUM GUIDES. For our guides the learning opportunities are endless and the appreciation of the Arboretum and its special places is greatly enhanced. This autumn, we shall begin a six-month guide training series which will enable our guides to offer a variety of experiences in the Arboretum to gardeners, youth groups, senior citizens and any other group that requests a tour. Although details for this training have not yet been formulated, we are already taking names of those who are interested in the program. To have your name included on the list, please call the Volunteer Coordinator any weekday between 10 AM and 4:30 PM, at (206) 543-8800.

JAN PIRZIO-BIROLI

Part of the Palmers' fruit orchard (planted in 1907), and vegetable garden on Jedidiah Island (page 35).
Photo: Bruce and Gordon Jones

A Tour of Jedidiah Island

*MARY PALMER**

May I have the pleasure of sharing with you my gardening endeavors and introducing to you the native and cultivated plant life of the Gulf Island region of British Columbia, Canada.

Several years ago my husband and I retired from Seattle to a small gulf island of 640 acres to pursue our interests in the preservation and the propagation of native and cultivated plants. Jedidiah Island is approximately 60 miles northwest of Vancouver, and 20 miles north of Nanaimo, B.C. Weather there is extremely mild. Temperatures in summer range from 50° to 72° F., sometimes to 98°; in winter from 34° to 59° F., sometimes as low as 26°. Winds are predominantly either from the southeast or the northwest, often reaching gale forces of 34 to 50 knots, occasionally 70. Individual storms usually last from one to two days. Snows are light and infrequent. The number of heavy, frosty days averages six per winter season. Average rainfall is from 30 to 34 inches, the bulk of which falls between October and April.

Fortunately, the island has several perpetual springs filled with water. During dry spring and summer weather, we may use up to 1600 gallons of water on our gardens and green-

* Mary Palmer, who operated a nursery in Lake City, was formerly Garden Editor for *The Seattle Times*.

house. A small gas motor pumps the spring water to a reservoir that is on top of an 18-foot high rock. Since 1907, Jedidiah has never lacked water, which is rare on the Gulf Islands.

The outer terrain of the island is rugged. Volcanic or igneous rocks form its shell while in the interior wide, low valleys stretch outward and downward, descending from 500-foot hilltops to nearly sealevel. Near the shore, where the soil is thin over rock, it is light and sandy and slightly alkaline. Interior soils are predominantly filled with organic material, and are acidic.

Mosses, lichens, sedums and cacti carpet the peripheral areas of the island, with an additional scattering of windswept conifers. Virgin stands of Douglas fir *(Pseudotsuga menziesii)*, balsam fir *(Abies grandis)*, western yew *(Taxus brevifolia)*, Rocky Mountain juniper *(Juniperus scopulorum)*, Canadian hemlock *(Tsuga canadensis)*, lodgepole pine *(Pinus contorta)* and madrone *(Arbutus menziesii)* still thrive, enjoying magnificent girth and height. Between 1905 and 1906, areas with easy access to the sea were hand-logged with the help of oxen.

Native deciduous trees are surprisingly few in number. No vine maple *(Acer circinatum)* or Pacific flowering dogwood *(Cornus nuttallii)*, which are so common in other areas of this coast, are found here. However, huge specimens of large-leaved maple *(Acer macrophyllum)* are abundant. Cottonwood *(Populus trichocarpa)*, willow, wild cherry *(Prunus emarginata)*, wild plum *(Prunus subcordata)*, wild crabapple *(Malus fusca)* and an over-exuberant stand of alder are to be admired.

Small trees, shrubs and vines are welcome on this island for their leaf patterns, forms, flowers and seed pods. Clinging ferociously to the trunks of tall-growing conifers, honeysuckles *(Lonicera)* are spectacular. Snowberry *(Symphoricarpos)* is decorative in winter. The *Rubus* tribe (including *R. spectabilis*, salmonberry) provides treats for birds and other creatures. Wet, boggy land is carpeted with cranberry. Evergreen huckleberry *(Vaccinium ovatum)* and red huckleberry *(V. parvifolium)* are scattered in densely forested areas. Currant and gooseberry plants *(Ribes)* skirt the open fields. From early May to August, ocean spray *(Holodiscus)* sends out long panicles of foamy white blossoms which cover a small shrub. Salal *(Gaultheria shallon)* grows to a startling height and density. Languishing under the protection of tall coni-

(Left) 'Harrowcot', a new variety of apricot produced by the Western Ontario Fruit Growers' Experimental Station, Harrow, Ontario, Canada. Photo: B. & G. Jones

(Below) 'Brown Turkey' figs. Photo: B. & G. Jones

fers are shining Oregon grape *(Berberis aquifolium),* dull Oregon grape *(B. nervosa),* and creeping Oregon grape *(B. repens).* Bearberry or kinnickinnick *(Arctostaphylos uva-ursi)* creeps along, covering rocky outcroppings.

Wild flowers of the island are a capricious bunch. I will attempt to tell you of a few. Hidden in the deepest forest is *Monotropa,* Indian-pipe. June and July find wild roses in flowers of pink and sometimes white; bright orange rose hips follow the flowers. Monkey flower *(Mimulus),* its clear yellow blossoms speckled with red dots, thrives in wet, soggy soil. Forget-me-not *(Myosotis)* and lungwort *(Mertensia)* grow underfoot in pasture land. Checker-mallow *(Sidalcea)* with white or pink flowers is decorative in summer. Shooting-star *(Dodecatheon)* prefers wet, shady hide-aways in which to shine. Rice root, known locally as chocolate lily *(Fritillaria),* heralds the spring season with bell-shaped blossoms of brownish-purple spotted with green dots. Wild onion and garlic *(Allium)* with blue, white or purple onion-like flowers, provide zesty bites for all. Death-camas *(Zigadenus)* with grass-like leaves and white or yellow-green flower stalks flourishes in open sunny sites; the cattle and sheep appear to understand its toxic qualities and avoid it.

Nearly neglected is the fern family. Ground-hugging types to gigantic, tropical-appearing ferns grow exuberantly over the island. Leather-leaf polypody *(Polypodium scouleri),* gold-back fern *(Pitryogramma triangularis),* bracken *(Pteridium aquilinum),* sword fern *(Polystichum munitum),* lace lip-fern *(Cheilanthes gracillima),* northern maidenhair fern *(Adiantum pedatum),* mountain wood-fern *(Dryopteris austriaca),* licorice-fern *(Polypodium glycyrrhiza),* and green spleenwort *(Asplenium viride)* are a few of the many ferns to be appreciated.

Coming in from the forests I would like to take you on a leisurely walk through our cultivated gardens. Let us begin in the old fruit orchard that was originally planted with trees given to homesteaders in the early 1900s—eighty of them—consisting of apples, plums, pears, cherries and crabapples. Most of these original trees are continuing to produce well. We have culled out the non-productive ones and added several whips of as-yet unnamed

English walnuts from the tree in the background.
Photo: B. & G. Jones

peach, apricot, pear and nectarine trees that we are testing for the Canadian Agricultural Research Station at Harrow, Ontario. Fig trees are growing luxuriantly and yielding quality fruit. 'Brown Turkey', 'Genoa', and a locally grown, unknown variety that was given to us by a sailboat enthusiast from Bowen Island, B.C., are successful.

Two magnificent ancient English walnuts reach to the sky and are burdened with a full crop of nuts each autumn. Three years ago several black walnut trees were planted to give us dye matrials for our Suffolk sheep wool. Filbert nut trees give a great annual crop. We grow 'Barcelona' and 'Du Chilly' varieties for a sure crop of nuts, as the 'Barcelona' alone requires a pollinator.

Near to the orchard and with a southern exposure is a large rock formation that is covered with 'Niagara' grape vines. The wine cellar and jelly jars are well filled from these grapes. Strawberries are our first delight of the berry patch each spring. 'Rainier' seems to be most successful. In the past we have grown

'Northwest', 'Marshall' and 'Premier', but 'Rainier' produces larger, earlier and sweeter berries in our patch. Long trellises are hanging with 'Cascade' blackberries, and with logan- and boysenberries.

Now we come to the vegetable garden. It is a year-around venture. Spring finds it lush with salad crops, then the members of the cabbage family, followed by the root crops and the usual peas, corn, beans, and potatoes. Parsnips, kale, endive, Jerusalem artichokes, celery, leeks, kohlrabi and Chinese cabbage remain in the soil for fresh eating in winter. Even carrots and beets remain over winter in the outdoor ground. For fun, we grow peanuts, soybeans, a few cotton plants and even watermelons.

The maple leaf is the emblem of Canada, hence a fine specimen of trident maple *(Acer buergeranum)* is first on the list of cultivated trees. *Magnolia* x *soulangiana* is taking to island living, after a sickly start. Now it rewards us with lovely spring flowers and healthy green summer leaves.

Several years ago I started seed of various trees and shrubs from the Royal Horticultural Society of England. A sturdy stand of *Eucalyptus* trees is one result. Others are the *Ginkgo* and several species of azaleas and rhododendrons. There is also a type of hardy hibiscus that remains outdoors at all seasons; bright lavender-blue flowers decorate it in summer.[1]

Exbury, Ghent, Ilam and Knap Hill hybrid azaleas, along with *Rhododendron fortunei,* 'Bagshot Ruby' x 'America', dwarf hybrids x dwarf red hardy hybrids and 'Augfast' are rooting in our small greenhouse and coldframes.

Jedidiah herbaceous borders are aglow with many varieties of Jan de Graaf lilies, peonies, iris, wallflowers, primroses, hellebores, astilbe, Canterbury bells, hollyhock, delphinium, pansies and roses.

Rock outcroppings afford a splendid home for rock plants, including bitterroot *(Lewisia rediviva),* pinks *(Dianthus deltoides),* creeping thyme *(Thymus serpyllum),* rockcress *(Arabis), Aubrieta, Viola,* moss pink *(Phlox subulata),* and generous quantities of sedums of many varieties. Miniature bulbs brought from the Arboretum bulb sales include sapphire anemone *(Anemone blanda),* winter aconite *(Eranthis cilicica), Iris danfordiae,* glory-of-the-snow *(Chionodoxa luciliae), Cyclamen repandum* and star-of-Bethlehem *(Ornithogalum arabicum);* many species of narcissus and tulips cheer the rock gardens each springtime.

Before we finish let me tell you of a few curiosities. Boldly standing near an old cow shed is *Petasites japonicus* var. *giganteus.* Its rhubarb-like stalks rise up to eight feet, topped with huge felty leaves. In February, strange flower buds arise with inconspicuous white flowers, giving the landscape a subtropical appearance. *Amorphophallus rivieri* with its grotesque, calla-lily like blossoms of deep purple is startling; the plant thrives out of doors all year. The tubers were given us from a gardening friend in Seattle, who grew it indoors in winter there.

Visitors to Jedidiah point to *Euphorbia wulfenii* and exclaim, "What's that?" We too have always admired the planting of *E. wulfenii* in the Arboretum, and searched for a plant to take to the island. Its evergreen foliage is pleasing year around and spectacular chartreuse-colored flower heads top the foliage in spring.

Hardy gardeners and sailors are welcome to drop anchor and visit our gardens on Jedidiah at any season.

'Green Globe' artichoke thrives on Jedidiah Island.
Photo: B. & G. Jones

[1] probably *Abutilon (Corynabutilon) vitifolium,* native of Chile

Book Reviews

SEATTLE'S CITY FOREST: AN OWNER'S MANUAL. Published by the Seattle Engineering Department, Seattle, Washington. 16 pages, freely illustrated. Price: $1.50

An introductory paragraph defines the scope and purpose of this attractive production: "Seattle's city forest includes trees planted or left standing on private property, park plantings, and the trees alongside the street. This "manual" will highlight specific information about street trees, those planted by individual property owners and those planted by the City of Seattle. . . Since 1970, Seattle has planted about 20,000 street trees and has landscaped more than 50 new green spaces under Operation Green Triangle."

There is an extensive list of small, medium, and large varieties of shade and flowering trees recommended for street planting. A shorter list includes those trees either prohibited or not recommended for various reasons. The text provides suggestions both for planting and for the subsequent care of trees. For information and advice when needed, the addresses and telephone numbers of the City Arborist and Horticulturist are also given.

This booklet serves as a useful and authoritative introduction to the subject of the city forest, but does not provide details about the already accomplished plantings in the city. These plantings certainly will have a significant and beneficial effect upon the future appearance and well-being of Seattle.

Seattle's City Forest is available at the Arboretum office or from the Seattle Engineering Department, on the ninth floor of the Seattle Municipal Building.

BRIAN O. MULLIGAN

ALL ABOUT TREES, edited by Barbara Ferguson. Published through Ortho Books, Chevron Chemical Company, San Francisco, California, 1982. 112 pages, 243 color photographs, 135 illustrations, climate map, index. Price: $5.95

Many experienced gardeners view books such as *All About Trees* with skepticism. In the case of the revised edition of this Ortho Books publication, such skepticism is unwarranted. *All About Trees* contains a great deal of information which both new and experienced gardeners will find useful and interesting.

The book is divided into four major sections. The first, entitled "Viewpoints," is a combination of introductory remarks, a romantic overview and a discussion of functional uses of trees. We in the northwest may feel especially fortunate to have our large conifers, but reading the comments of people across the nation reminds us that every region of our country is blessed with trees.

Perhaps the most interesting section is "How A Tree Grows," written by Dr. Richard Harris of the University of California. In a clear, concise fashion the development of a tree is examined. What makes this discussion particularly interesting is that it will give many gardeners an explanation of the scientific basis (or lack of it!) for many horticultural practices. The selection, planting, and after-care of trees is especially emphasized. From my perspective, this section should be required reading for anyone who has ever picked up a pair of pruning shears or a shovel!

The final two sections deal with tree selection. Experienced gardeners may be disappointed because the plant material covered is somewhat limited. The importance of having a purpose in selecting and planting a tree is emphasized. Trees for specific uses such as "pest-free" and "screens and buffers" are listed. Almost half the book is composed of an "encyclopedia" of approximately 350 tree species, with some cultivars. A short discussion of their ornamental characteristics, functional value, and culture is presented. Since the book is prepared for a national audience, only a part of the listed species are adapted for and available in our area.

While *All About Trees* has its limitations, I found it well-written and informative. Despite a few minor errors in content, many gardeners will find it very educational.

JAMES R. CLARK

Editor's Note: Several local plantspeople were involved in the production of this book. The University of Washington Arboretum provided "a wealth of information" towards the content, with Brian O. Mulligan as an author and Joseph A. Witt as a consultant. Sharon Collman, King County Entomologist, provided a photograph.

THE NEW YORK BOTANICAL GARDEN ILLUSTRATED ENCYCLOPEDIA OF HORTICULTURE, by Thomas H. Everett. Garland Publishing Inc., New York, New York, 1982. Ten volumes, 3,601 pages, 10,000 photographs. Hard cover. Price: approximately $525.00

Liberty Hyde Bailey, the great American horticulturist, authored the *Standard Cyclopedia of Horticulture* in 1914. Until now, we have had no new encyclopedia comparable to Bailey's to document the state of the art in North American horticulture. During the intervening years, there have been advances in horticultural science, and recently, home gardening has had a popular reception as a recreational and practical pastime. The era of the great estates with crews of professional gardeners has passed. Now, vast numbers of country, suburban, and city gardeners along with institutional horticulturists demand accurate information in dealing with contemporary horticultural problems. The well-educated gardeners of today have questions about recent advances in plant propagation, indoor plant use, pest control, and plant cultivation. Up-to-date reference material is needed to satisfy both curiosity and practicality. *The New York Botanical Garden Illustrated Encyclopedia of Horticulture* is intended to be a comprehensive reference capable of answering both basic and highly technical questions arising in the science and art of horticulture.

Thomas H. Everett, the author of this monumental work, is hailed as one of the foremost horticulturists of our times. Through his career of the last half century he has earned an international reputation as a practical gardener, author, lecturer and consultant. After graduating from the Royal Botanical Garden at Kew, England, he subsequently continued his career at the New York Botanical Garden in 1932 where he is presently Senior Horticultural Specialist. Other books to which Mr. Everett has contributed include the *Encyclopedia Britannica*, *The Reader's Digest Complete Book of the Garden*, and the *Reader's Digest Illustrated Guide to Gardening*. For the past twelve years, Mr. Everett has been consulting with authorities on specific horticultural subjects and composing the whole of the text for the encyclopedia under review.

According to Everett, the primary objective of this work is to present "a comprehensive description and evaluation of horticulture as it is known and practiced in the United States and Canada by amateurs and professionals. . ." It is written with the amateur in mind because, according to the author, "amateur gardeners are devotees of the most widespread avocation in the United States. . ." and "amateurs provide the solid base upon which American horticulture rests. . ." To this end, the use of scientific language is minimized, or explanations are provided for the terms. The *Encyclopedia* should be a fundamental reference not only for gardeners and professional horticulturists, but also for allied professionals including landscape architects, ecologists, educators, and botanists who increasingly find themselves working on interdisciplinary problems requiring horticultural information.

A few startling facts surface in contemplating the scale of these ten volumes. Among the some three million words, there are a total of 10,000 photographs of which several hundred are in color. Taxonomic descriptions are included for 260 plant families, 3,600 genera and 20,000 species, varieties and cultivars. There are 900 entries dealing with horticultural subject matter other than taxonomic descriptions. Included are monthly gardening reminders for different geographic regions, and essays on the use of plants indoors and in exterior landscape design. In terms of use of popular plant material and methods of plant cultivation, this reference offers thorough coverage.

Subject matter in the *Encyclopedia* is listed alphabetically by topic or taxon above the species level. Each description of a genus is broken into three main parts. First is background information which includes facts concerning range, history, the number of species contained, and a narrative description of species, varieties and cultivars. In dealing with the descriptions of taxa below the generic level, I was frustrated by the fact that the descriptions of species and varieties are not uniformly alphabetized but seem to grow organically one from the other. This makes it tedious to isolate information regarding a particular variety for which information is needed quickly, especially since there is no index. (Perhaps Mr. Everett is taking an opportunity to force knowledge upon his readers by making it necessary to scan all descriptions to find the one desired.)

The second and third parts of the descriptions of genera describe the landscape uses of members of the genus and provide specific cultural information. It should be noted that nomenclature has, for the most part, been adopted from the 1976 edition of *Hortus III* and that cross-referencing between common and Latin names within the text allows for easy location of plants of interest.

As a private collector of horticultural books, I readily admit that the question I asked myself in reviewing the *New York Botanical Garden Illustrated Encyclopedia of Horticulture* was, "Would I buy it?" While this may be an appropriate purchase for a university or botanical garden library, for many of us who earn our living in horticulture the prohibitive cost of the *Encyclopedia* compared with that of other references currently available makes it difficult to justify the expense. Perhaps a more reasonable expenditure of personal resources, and in most instances just as useful, would be in the purchase of a few good books such as *Wyman's Gardening Encyclopedia* by Donald Wyman, *Manual of Woody Landscape Plants* by Michael Dirr, or *Sunset New Western Garden Book*. Information from one of these authorities can complement that from another and still allow for well-rounded and less costly knowledge in the avid reader.

ANDREW F. GORSKI

Editor's Note: While this work constitutes a good general reference, specialists might find that the treatment of certain plant groups is not sufficiently detailed to be definitive.

Books briefly noted:

NEW PLANT SOURCES FOR DRUGS AND FOODS FROM THE NEW YORK BOTANICAL GARDEN HERBARIUM, by Siri von Reis and Frank J. Lipp, Jr. Harvard University Press, 1982.

This is the second volume of a most interesting and useful reference work. Like its companion *Drugs and Foods from Little Known Plants* by von Reis (Harvard University Press, 1973), it is a compilation of collectors' notes taken from herbarium sheets. The first book used the Harvard University Herbaria as the source. This, as indicated in the title, used the New York Botanical Garden Herbarium. Between these two great herbaria there is a tremendous cross-section of plants representing all regions of the world.

The thrust of the work is to catalogue in an easily usable form the vast amount of information on drug and food uses provided by plant collectors as they gather and annotate herbarium specimens. Much of this information is from local folklore and may represent the only source for such uses in undeveloped countries.

The format of the book is the same as that of the earlier work; the notations are arranged by plant families, then alphabetically by genus, then by species. Within each entry there is the name of the plant, the country where collected, the collector's name, the collector's number for the specimen, the year collected and finally the note about the plant's use.

One would think that the 4571 paragraphs with nothing but names, numbers and a word or two about the plant would be dull reading. It is not! For

instance, did you know that leaves of *Begonia rossmaniae* could be used for curing itch?; that three species of *Wikstroemia* (a relative of *Daphne)* from three different areas of the Pacific are used as fish poisons? or that the fruits of *Raphiolepis indica* are eaten by natives and also used as a dye? Even more fascinating is the fact that the fruit of *Coussapoa glaberrima* is reputed "to soften teeth and gums for extraction" and that *Polysphaeria parvifolia* from Tanganyika may have its roots boiled and the water drunk for a male aphrodisiac—and also be used for pain on the left side of the stomach!

Why does the Arboretum have such esoteric source-books? In part this is because we continually receive requests for information on poisonous plants about which we have no knowledge. We can often get some indication of the edibility or toxic qualities of the plant or a close relative from this source. Besided, this book is such fascinating reading, even if somewhat disjointed.

JOSEPH A. WITT

Washington Park Arboretum Visitor Center

The new Visitor Center will soon be a reality. Plants to be saved are being removed to the nursery; the lath houses are gone and the area is being readied for actual construction. The final design of the building will include a 100-place meeting room; an entrance lobby with space for displays, books and an information counter; a small reference library and offices for University of Washington administrative and Arboretum Foundation staffs. There will be storage facilities in the basement including space for tables and carts used during plant and bulb sales. Landscaping will be appropriate. There will be ample parking areas and the grounds maintenance facilities will be located in the area of the barn. The Foundation is funding the building and the Arboretum Capital Improvement Trust Fund provides the site plan improvements. The design team is McAdoo, Malcolm & Youel, architects; the landscape architects are Jongejan/Gerrard/McNeal; the consulting engineer is Centrac, Inc., and the color coordination-interiors are by Behrens-Benedict, Ltd. Furnishing the interior represents an additional cost and funding will be addressed later.

Target date for completion is early 1984.

At long last. . .

News from the Arboretum

The greatest excitement in recent years involves the progress being made on the visitor center. While much of the planning is being done elsewhere, the most visible signs of progress are occurring around the office and greenhouse area. Although the new center eventually will be constructive, some of the early preparations appear to be destructive. Many of the smaller plant specimens located around the office building were moved to the nursery in March and early April. In May, with the help of Seattle Park and Recreation Department staff and equipment, the row of Sawara cypress and western red cedar west of the storage barn was cut down (the poles will be saved for use in the Japanese Garden) and the tractor sheds nearby demolished. This is to make way for the relocated maintenance yard. Soon after, the two lath-houses north of the greenhouse were levelled. (Most of the plants they contained had been moved earlier and the vines too large to move were repropagated.) The vista toward the greenhouse that their removal revealed was startling to say the least. For more than forty years these old structures had masked the facade of the two glass-houses from view. They now appear stark and naked, almost asking that we hurry to get the visitor center built so they can be covered again decently.

JOSEPH A. WITT

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Numerical listing followed by one asterisk indicates photograph only; two asterisks indicate photograph and citation.

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Events of Interest

FOURTH THURSDAY WEEDERS' DAY: enjoy the fellowship and satisfaction of coming to help spruce up the Arboretum on the fourth Thursday of each month, July 28 and August 25, this summer.

Don't miss a brand-new event: SUMMER STROLL IN THE ARBORETUM, Sunday, August 14, from 3 to 7 PM. All are invited to this non-profit party in the Arboretum. See the back cover for details.

The ANNUAL MEETING OF THE PACIFIC NORTHWEST HEATHER SOCIETY will be held August 27 and 28 in Corvallis, Oregon. For further information please contact Mrs. Pauline Croxton, 6309 Green Valley Road, Placerville, California, 95667.

The THOMAS BURKE MEMORIAL WASHINGTON STATE MUSEUM is involved with a number of events concerning art and artifacts of native Americans, exhibits which will open this summer. CROW'S SHELLS: ARTISTIC BASKETRY OF PUGET SOUND, showing until August 14, will include samples of plant materials used in basketry. PRANCING AS THEY COME: PLAINS AND PLATEAU INDIAN ART, opens July 22 and features household goods, weapons, musical instruments and beaded ceremonial regalia, with lavish geometric and floral motifs. The American Indian Women's Service League joins with the Burke Museum in presenting AMERICAN INDIAN ARTS: YESTERDAY AND TODAY, an informative exhibit providing a setting for a demonstration series by Seattle-area Eskimo and Indian artists and craftspeople, August 23 until November 6. For further information regarding these events, call (206) 543-5590.

Classes of Interest

Urban Horticulture—Arboretum

These classes are open to the public; many of them start towards the end of July. To register and for further information call (206) 545-8033.

SUMMER CUTTINGS, with Richard van Klaveren, two weekday evenings.

PLANT PHOTOGRAPHY WORKSHOP, with Bernard Nist, one Saturday.

OUTDOOR DRAWING WORKSHOP, with Laura Dassow, one Saturday.

CONTAINER GARDEN TOUR, with Pat Campbell Brain, one Saturday.

University of Washington Continuing Education

Several of these classes begin the last week of July. For information call Spectrum, (206) 543-2590.

PLANT ECOLOGY ON MT. RAINIER, with Ola Edwards, one weekend.

A TRIP TO THE STARS: GOLDENDALE OBSERVATORY, with Woodruff T. Sullivan, one weekend.

TRAP FLOWERS, BUMBLEBEES AND BUTTERFLIES: THE ART OF FLOWER POLLINATION, with Bastiaan Meeuse, one weekend.

NATURE PHOTOGRAPHY IN THE FIELD, with Tom Boyden, one weekend and a Saturday.

SCENES OF SEATTLE: PHOTO TECHNIQUES FOR TRAVELERS, with James O. Sneddon, two evening sessions and a Saturday.

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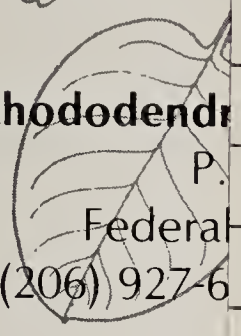

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A Summer Stroll in the Arboretum

Sunday, August 14, 1983 3 to 7 PM

We extend an invitation to all garden-oriented people to join members of the Arboretum Foundation in a summer stroll and picnic at Washington Park Arboretum. This is a party not-to-be-missed! Amble along marked trails for either a long or a short walk in Seattle's cool and shady urban forest. Bring a picnic to spread on the lawn, bring your family, bring your friends.

The Arboretum Foundation will provide balloons, wandering musicians, maps and information about the Arboretum, and for a nominal fee will offer cold drinks and desserts to eat in your fingers. Hosts and hostesses will be on hand to greet you and to answer your questions. The festivities will be focused on Upper Arboretum Drive, with entrances at either end of Azalea Way.

The purpose of this event is the promotion of Arboretum Awareness: to acquaint the public with their quiet in-city forest, the world-class collection of trees and shrubs that is the Arboretum, a grand place to see mature plant material that one might choose for one's own garden.

With solstice past

the summer sun

drenches glades of greenery.

EXPLORERS' WALKS will continue to be offered by the Arboretum Naturalist on the fourth Wednesday of each month: July 27, August 24 and September 28, 10 AM to noon. Meet at the Arboretum Office and wear adequate footgear, even in warm weather.